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ON
CONTRACTIONS OF THE FINGERS
AND ON
HAMMER-TOE.



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ON
CONTRACTIONS OF THE FINGERS

(Dupuytren's and Congenital Contractions.)

AND ON
“HAMMER-TOE.”

INCLUDING

TWO ESSAYS ON DUPUYTREN'S CONTRACTION OF THE FINGERS, AND ITS
SUCCESSFUL TREATMENT BY SUBCUTANEOUS DIVISIONS OF THE
PALMAR FASCIA, AND IMMEDIATE EXTENSION.

ONE ESSAY ON CONGENITAL CONTRACTION OF THE FINGERS AND ITS
ASSOCIATION WITH HAMMER-TOE:—ITS PATHOLOGY AND TREATMENT.

ONE ESSAY ON THE SUCCESSFUL TREATMENT OF HAMMER-TOE, BY THE
SUBCUTANEOUS DIVISION OF THE LATERAL LIGAMENTS.

AND ONE ESSAY ON THE OBLITERATION OF DEPRESSED CICATRICES AFTER
GLANDULAR ABSCESES, OR EXFOLIATION OF BONE, BY A
SUBCUTANEOUS OPERATION.

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With Eight Plates and Thirty-one Wood Engravings.

Second Edition.

LONDON:
J. & A. CHURCHILL,
11, NEW BURLINGTON STREET.

1892,

2272



“ON CONTRACTIONS OF THE FINGERS AND HAMMER-TOE.”

NOTE TO THE SECOND EDITION.

IN offering to the profession a second edition of my Essay on “Contraction of the Fingers, Dupuytren’s Contraction” published in the year 1879, which has been several years out of print, I have with some alterations in the text, and additional illustrations of the improved retentive splint, &c., reprinted the original Essay. But I have added, as an appendix to the Essay on Dupuytren’s Contraction, a paper which I read at the Medical Society of London in March 1890, entitled “Further Observations on the Treatment of Dupuytren’s Finger-Contraction,” giving a resumé of the work done, chiefly by American and English Surgeons, during the ten years which had elapsed since my Essay was published.

In the present edition I have also added an Essay “on Congenital Contraction of the Fingers, and its association with ‘Hammer-toe’; its Pathology and Treatment.” This paper was read at the Medical Society of London on December 8th, 1890. The successful treatment of these cases when they have

reached either the second or third stage of confirmed contraction, I only learned by an experimental operation in the year 1885, but its success has now been established by a sufficient number of cases.

I have also added to the present edition an Essay "On the Successful Treatment of 'Hammer-toe' by the subcutaneous division of the lateral ligaments," an operation I was led to adopt many years ago from clinical observation, after observing the failure of tenotomy to cure these cases. The necessity of this operation has been since demonstrated by the pathological observation of Mr. Shattock of St. Thomas' Hospital, whose dissections of two amputated hammer-toes are represented in the accompanying plate. This paper was read at the Medical Society of London in March, 1888.

Since the Essays included in the present edition were in print, "Contractions of the Fingers and Toes" have formed the subject of a course of three lectures, delivered by Mr. William Anderson at the Royal College of Surgeons in June, 1891, and since published in *The Lancet*. The subject has been ably treated in its widest range, including all the recognised forms of contraction with general concurrence in the views, and especially the operative treatment for Dupuytren's Contractions which I have been led to adopt.

The Essay "On the Obliteration of Depressed Cicatrices by a Subcutaneous Operation" which formed part of the first edition, I had intended to withdraw from the present issue, as being foreign to

the other subjects now brought forward; but from its importance as a subcutaneous operation, and as forming a part of the first edition, I have been induced to reprint it with some additions.

The present edition, with the new material which I have added, including the results of the experience and observation by other surgeons as well as my own, during the twelve years which have elapsed since the first edition was issued in 1879, will, I trust, be equally acceptable to the profession.

In passing the present edition through the press, my best thanks are due to my colleague Mr. Macready, who has carefully studied these subcutaneous operations, for his very able assistance.

All the new wood engravings have been drawn and engraved with the greatest care by Mr. Danielsson.

*Henrietta Street, Cavendish Square,
September, 1891.*

PREFACE TO THE FIRST EDITION.

IN the Essays now published I have given a description of two subcutaneous operations for the successful treatment of affections not generally considered to be amenable to any surgical means, viz.: “*Dupuytren’s Contraction of the Fingers*,” and “*Deeply Depressed Cicatrices*,” such as are frequently met with in the neck and other regions of the body, as the result either of glandular abscesses or exfoliation of bone.

In proof of the general distrust in all operative procedures for contracted fingers, I may state that in nearly all the cases which have fallen under my observation in private practice, the patients have been deterred from submitting to any operation by the opinions of several surgeons that the fingers if straightened would remain stiff and useless, or worse than useless, for life, in consequence of the tendons having been divided, an event which I have shown cannot possibly occur in the operation advocated in the present paper.

The patients have in many instances been told that as the contracted fingers are still useful in grasping, they should wait until they had become useless by

increase of the contraction, and then take the chances of an operation. Now that the curability of this affection, without any loss of muscular power has been proved, the error of delay will be at once apparent.

The results of mechanical treatment, and of the operation by open-wound have not been such as to inspire any general confidence.

The subcutaneous operation and after-treatment, as devised by myself in accordance with the pathological conditions first demonstrated by Dupuytren, has proved so successful, that I can with confidence recommend it to the favourable notice of the profession.

I first brought the results of my experience before the Medico-Chirurgical Society in a paper read on the 22nd of May, 1877, but this paper was not published by the Society in their "Transactions;" a short abstract of it only appeared in the "Proceedings" of the Society, Vol. VIII., No. 4, July, 1877. The paper, as read at the Society, and without any alterations, was, however, published in the "British Medical Journal," June 29th, 1878, and is now with considerable additions reproduced in its present form.

With regard to the subcutaneous operation for deeply depressed cicatrices, I first brought it before the notice of the British Medical Association in a paper which I read at their meeting in Edinburgh in August, 1875; and it was afterwards published in the *British Medical Journal*, April 20th, 1876. It

seems, however, not to have attracted the attention of operating surgeons so much as I could have wished, and I have therefore reprinted it with some additions, in its present form, in the full confidence that results equal to those which I have obtained would follow its more general adoption.

The two operations, now described, possess one feature in common, viz., that they are both good examples of the success which attends all true subcutaneous operations, and in their freedom from all danger which might result from inflammation and suppuration, illustrate the protective influence of the law of subcutaneous surgery.

Henrietta Street, Cavendish Square.
September, 1879.

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Fig. 4.—The same foot some time after the operation.

PLATE I.

FIG. 1.

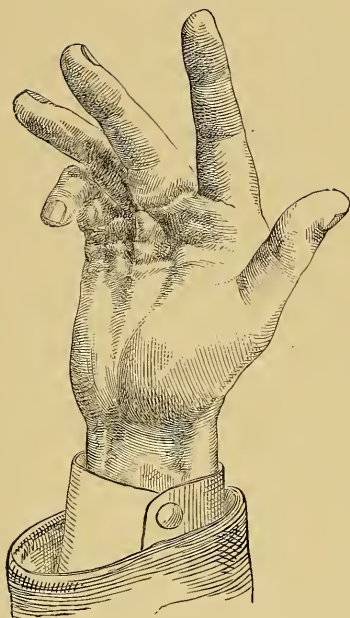


FIG. 2.

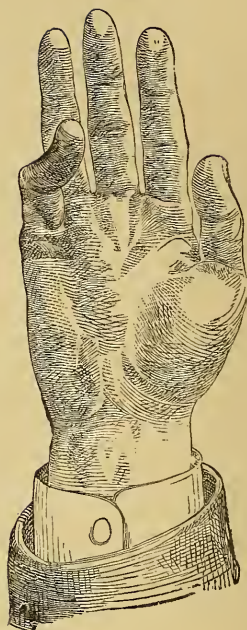
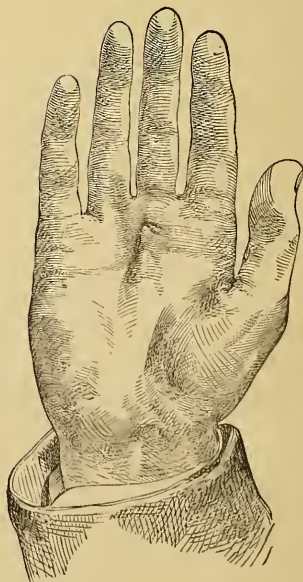


FIG. 3.



FIG. 4.



DESCRIPTION OF PLATE I., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction, involving the middle, ring, and little fingers in the right hand—entirely palmar in the middle and ring fingers, but phalangeal in the little finger, after an injury to the joint from a severe blow.

The patient, a gentleman, æt. 55, upon whom I operated in February, 1864. In the palm of the hand are seen two prominent cords, or bands of palmar fascia, leading from the first phalanges of the middle and ring fingers towards the centre of the palm of the hand; the second phalanges of these two fingers were not involved in the contraction. The little finger is drawn down partly by one of the central bands, and partly by an external lateral band. In this finger, also, the second phalanx was contracted, and drawn down at a right angle with the first, partly by fascial contraction, and partly by articular changes resulting from rheumatic gout and aggravated by an accident. This gentleman had for many years been engaged in the diplomatic service, in which he still continues, and had not used this hand in any special manner. He is a member of a very gouty family, and although he has not suffered from acute gout in the great toe, he has been subject to other gouty affections, and many of the articulations of the fingers were a little enlarged and altered in shape by rheumatic gout. The contraction of the little finger had commenced five years previously, after a severe injury, and the middle and ring fingers between three and four years before he came to me. The effect of the contraction, chiefly from the drawing down of the middle fingers, was to interfere with his power of writing, so that his signature was scarcely legible. Six punctures were made at the operation, and the extension was made as rapidly as it could be borne by the patient—an instrument similar to that represented in Fig. 12 being used. The middle and ring fingers were straightened in a fortnight, but the little finger took nearly six weeks, and then the contraction between the first and second phalanges could not be completely overcome in consequence of articular changes. Drawing taken from a cast.

Fig. 2.—The same hand as shown in Fig. 1 thirteen years after operation. The middle and ring fingers remained permanently cured, with full power of flexion; and all trace of contraction in the palm of the hand had disappeared. The contraction of the little finger, which never could be brought quite straight, from alterations in the joint, had relapsed to some extent, between the first and second phalanges—but the first phalanx remains on a straight line with the metacarpal bone. Drawing taken from a cast.

This gentleman has been frequently seen by me since the operation, and I am able to state that up to the present time—December, 1891—twenty-seven years after the operation, no recontraction has taken place in the middle and ring fingers, which he can use with perfect freedom. Nor has the contraction of the little finger, which was of traumatic origin, increased beyond that represented in Fig. 2. But in the left hand a similar contraction, which commenced ten years ago, has been steadily increasing. From his age, however, and the little inconvenience the contraction occasions, he is not desirous of submitting to any operation.

It is remarkable that Dupuytren's contraction, evidently of constitutional origin, should be developed in the opposite hand at a late period, without any relapse occurring in the hand operated upon; a continuance and extension of the morbid process rather than relapse.

Fig. 3.—Dupuytren's contraction involving the middle, ring, and little fingers in the right hand—entirely palmar—occurring in a medical man,

æt. about 60, a fellow student with me at St. Thomas Hospital, upon whom I operated in January, 1877. In the palm of the hand can be seen an unusually tense and prominent cord, or band of palmar fascia, leading from the first phalanges of the middle and ring fingers towards the centre of the palm of the hand. The second phalanges were not involved in the contraction. The little finger was being drawn down by a lateral band from the central cord. This gentleman has suffered from gouty affections for many years, and several of the articulations of the fingers are enlarged and altered in shape, though he has not been the subject of acute gout. The contraction had commenced eight or ten years before the operation, and was steadily increasing, so that as a professional man the inconvenience was found to be very great. The operation was performed under the ether-spray, as described at page 69, four punctures being made. All the contraction was completely overcome at the time of operation, and the method of immediate extension was successfully carried out. The fingers being retained in position by the splint and bandage represented in Fig. 6, and the splint applied on the dorsal aspect of the hand and finger represented in Fig. 12, was afterwards employed as described at page 67. Drawing taken from a cast.

Fig. 4.—The same hand as shown in Fig. 3, more than two years after the operation. The fingers remain quite straight with full power of flexion, a little thickening of the skin at the seat of contraction only remains. Drawing taken from a photograph.

I have frequently seen this gentleman since the operation, and am able to state that up to the present time—December, 1891, fourteen years after the operation—no disposition whatever to recontraction has shown itself, and he has free use and power in the fingers operated upon.

Recently a fascial band in the palm of the hand, leading towards the little finger, has shown itself, but the finger is not as yet at all contracted.

PLATE II.

FIG. 1.

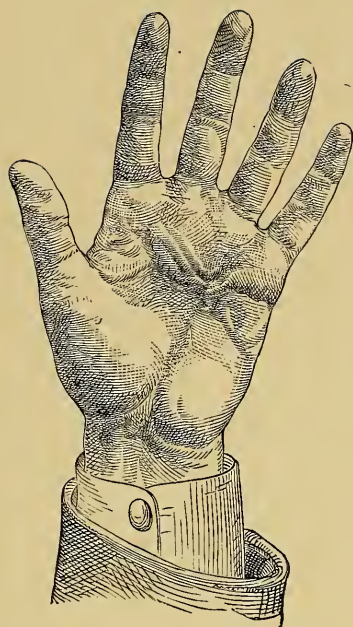


FIG. 2.

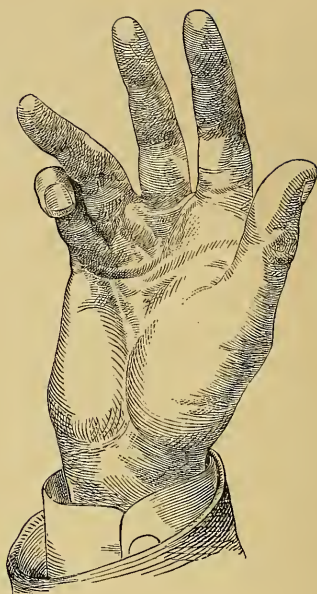


FIG. 3.

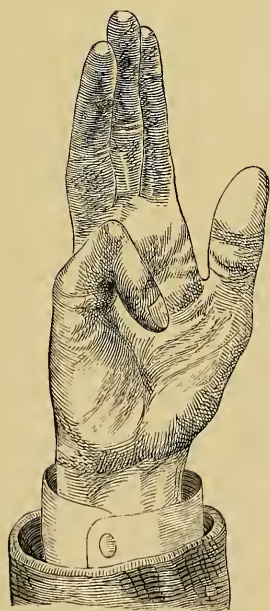
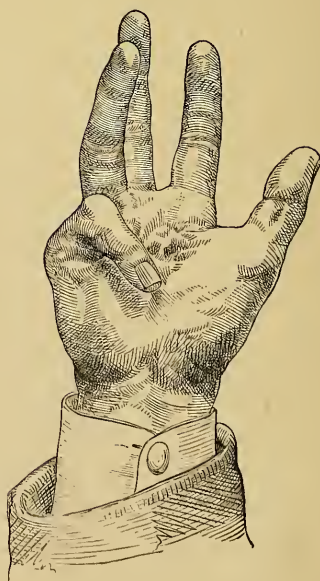


FIG. 4.



DESCRIPTION OF PLATE II., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction affecting the ring and little fingers in the right hand, in a severe degree, and the middle finger to a less extent—entirely palmar—with a deep puckering of thickened skin in the palm of the hand.

Left hand of a barrister, æt. 55, upon whom I operated in June, 1874, showing the successful result of treatment nearly two years afterwards. Taken from a cast. No cast or photograph was taken of this case previous to operation, but it was the little finger which was drawn down more than half way towards the palm of the hand, by a contracted band of palmar fascia along the outer margin of the first phalanx, and the external border of the hand. There was also a contraction between the first and second phalanges in the little finger. The ring finger was drawn down only to a moderate extent, by a contracted band of fascia leading to the transverse crease in the palm of the hand. The contraction in both fingers was increasing, and a source of much annoyance and inconvenience to the patient, who was a long time deterred from submitting to treatment by the adverse opinions given by several surgeons. The contraction of the little finger was attributed to a blow eight years previously, but he was a feeble dyspeptic man with gouty symptoms.

At the operation, assisted by Dr. Savage, of Gloucester Place, who attended, this gentleman, it was necessary to make four divisions of the palmar fascia, and the chief difficulty was to overcome the contraction between the first and second phalanges. However, both fingers were completely straightened at the time of operation, and in this case the immediate extension principle succeeded, the only apparatus employed being the splint represented in Fig. 6, and a small finger splint afterwards. The drawing Fig. 1 shows a little puckering of thickened skin still remaining at the transverse crease in the palm of the hand, but the fingers remained quite straight and the power of flexion had never been interfered with.

No tendency to relapse was shown in this case up to the period of his death, about four or five years ago, from general failure, supposed to be due to kidney and liver disease.

Fig. 2.—Dupuytren's contraction involving the ring, and little fingers—both palmar and phalangeal—in the right hand of a gentleman, æt. 55 years, upon whom I operated in April, 1868. In the palm of the hand is seen a tense prominent cord leading from the angle between the contracted fingers, to the central part of the palm of the hand. This was evidently formed by one of the four primary divisions of the palmar fascia, and its direction towards the angle between the middle and ring fingers is explained by the digital prolongations on the opposed sides of these two fingers being specially involved in the contraction. I have observed this in many cases and mentioned it as diagnostic of the fascial origin of the contraction. If the prominent cord had been formed by contracted tendon it would necessarily preserve its direction in the median line of the finger. The contraction between the first and second phalanges of the little finger was not severe. This gentleman had been engaged for many years as a merchant, and had not used this hand in any special manner. As to gout the case is the one alluded to in the text, page 24, as having an attack of gouty swelling of the hand three weeks after the operation; for this he was attended by the late Dr. Halley, of Harley Street, who also assisted at the operation. This patient had, some years previously, suffered from gouty inflammation of the eye, but never had acute gout in the foot.

The contraction had existed several years, and was steadily increasing—especially in the ring finger—so that the inconvenience was considerable. The fascial band and digital prolongations were divided in four places, and although the immediate extension principle could not be fully carried out in consequence of the contraction between the first and second phalanges of the little finger, the extension was made as rapidly as it could be borne by the patient, all the contraction being completely removed, without any loss in the power of flexing the fingers.

The drawing was taken from a photograph, but no photograph was taken of the case after treatment; the patient left town and I have not since seen him.

Fig. 3.—Right hand of a medical man, æt. 45, showing an extreme degree of contraction in the little finger which had been operated upon by open-wound some years before he consulted me in 1863, the contracted fascia being, I believe, dissected out rather than simply divided. Re-contraction took place in an aggravated form as mentioned in the text, page 44, and as in all relapsed cases after open-wound the cicatricial contraction could not be overcome, and therefore the contraction between the first and second phalanges remained permanent, though somewhat improved by gradual mechanical extension. In this case, however, I divided a tense fascial cord in the palm of the hand, by which the first phalanx was drawn down, and this contributed so much to the improvement that he no longer wished to have the finger amputated, which he had first desired. Drawing taken from a cast.

Fig. 4.—Dupuytren's contraction involving the little and ring fingers—both palmar, and phalangeal—in the right hand of a gentleman, æt. about 40, upon whom I operated in March, 1868, showing an extreme degree of contraction of the little finger, the tip of which was nearly in contact with the palm of the hand. The second phalanx was drawn down to a right angle with the first, and the first phalanx was flexed upon the palm of the hand, by a fascial cord leading to the palm, and an external lateral band along the margin of the finger and outer border of the hand. The ring finger was contracted only to a moderate extent, the first phalanx being drawn down by a fascial band towards the palm. The skin in the palm of the hand was thickened, dimpled, and corrugated. In this gentleman the little and ring fingers in the left hand were also contracted but to a less extent, and I had operated upon these fingers successfully in 1867.

The little finger of the right hand was straightened with some difficulty by means of the finger instrument represented in Fig. 12, but was brought into a straight line with the metacarpal bone in seven weeks, the fascial bands having been divided in four or five places. This gentleman was decidedly of a gouty diathesis, and the contraction had been increasing for many years. I saw him again nine years after the treatment, a partial relapse of the contraction had taken place in the little finger only between the first and second phalanges, such as will occur in cases of great severity if not prevented by the patient wearing an extension splint at night. Drawing taken from a photograph.

The contraction had existed several years, and was steadily increasing—especially in the ring finger—so that the inconvenience was considerable. The fascial band and digital prolongations were divided in four places, and although the immediate extension principle could not be fully carried out in consequence of the contraction between the first and second phalanges of the little finger, the extension was made as rapidly as it could be borne by the patient, all the contraction being completely removed, without any loss in the power of flexing the fingers.

The drawing was taken from a photograph, but no photograph was taken of the case after treatment; the patient left town and I have not since seen him.

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Fig. 4.—Dupuytren's contraction involving the little and ring fingers—both palmar, and phalangeal—in the right hand of a gentleman, æt. about 40, upon whom I operated in March, 1868, showing an extreme degree of contraction of the little finger, the tip of which was nearly in contact with the palm of the hand. The second phalanx was drawn down to a right angle with the first, and the first phalanx was flexed upon the palm of the hand, by a fascial cord leading to the palm, and an external lateral band along the margin of the finger and outer border of the hand. The ring finger was contracted only to a moderate extent, the first phalanx being drawn down by a fascial band towards the palm. The skin in the palm of the hand was thickened, dimpled, and corrugated. In this gentleman the little and ring fingers in the left hand were also contracted but to a less extent, and I had operated upon these fingers successfully in 1867.

The little finger of the right hand was straightened with some difficulty by means of the finger instrument represented in Fig. 12, but was brought into a straight line with the metacarpal bone in seven weeks, the fascial bands having been divided in four or five places. This gentleman was decidedly of a gouty diathesis, and the contraction had been increasing for many years. I saw him again nine years after the treatment, a partial relapse of the contraction had taken place in the little finger only between the first and second phalanges, such as will occur in cases of great severity if not prevented by the patient wearing an extension splint at night. Drawing taken from a photograph.

PLATE III.

FIG. 1.

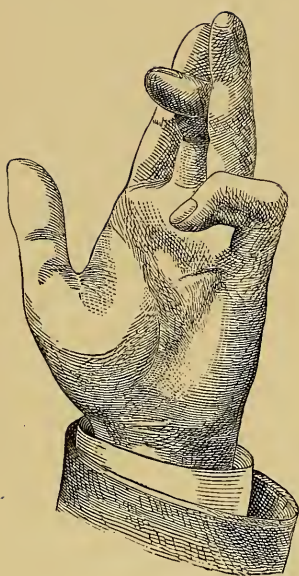


FIG. 2.

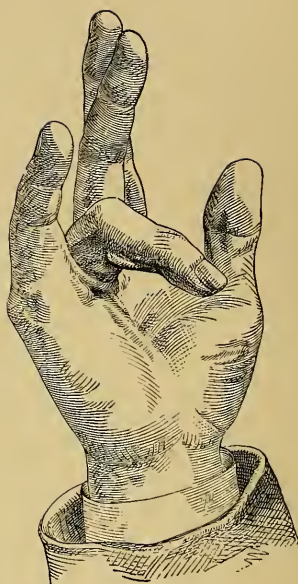
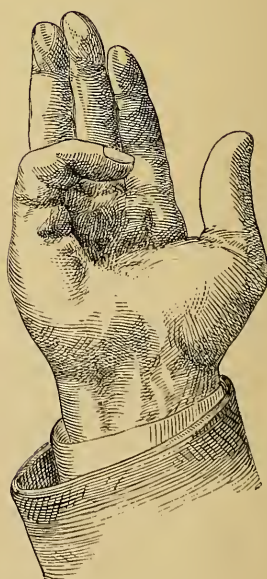


FIG. 3.



FIG. 4.



DESCRIPTION OF PLATE III., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction affecting the middle and little fingers in the left hand—entirely phalangeal—of an officer in the army, æt. 46, upon whom I operated in March, 1863, showing a severe degree of contraction of the little finger between the first and second phalanges, the second phalanx being drawn down fully to a right angle with the first phalanx, without the first phalanx being at all drawn down towards the palm of the hand. The fascia was thickened and contracted along the palmar aspect of the finger, in the central part, and also along the outer border of the finger, from which a band extended along the external margin of the palm of the hand; but was not so prominent as in other cases in which the first phalanx is drawn towards the palm of the hand.

In this hand the second, or middle, finger was also contracted between the second and third phalanges, as shown in the drawing, and to a slight extent between the first and second phalanges. The first phalanx was not at all contracted or drawn towards the palm of the hand, and there was no evidence of contraction of the palmar fascia, *i.e.*, of any of the four primary divisions of the fascia in the palm of the hand, nor was there any thickening of the skin, or dimpled depression in the palm of the hand; the digital prolongations alone, between the first and second phalanges in the little finger, and between the second and third phalanges in the second finger, seemed to have been the seat of contraction—a rare form of the affection we are now describing.

In this gentleman's case the ring finger of the right hand was also contracted, the second phalanx being bent upon the first, and the first phalanx drawn down towards the palm of the hand, by a fascial cord leading to the transverse crease in the palm, where a dimpled depression with some thickening of the skin existed.

The contraction in this case could not be explained by the hands having been used in any special manner, and although the patient had never suffered from regular gout, his medical attendant, the late Mr. Ince, considered him to suffer from gouty dyspepsia. The contraction of the little finger had commenced thirteen years ago, but had much increased of late years, and was a source of annoyance and inconvenience, interfering very much with the use of the gun and fishing-rod. The second finger had been contracted for several years, but was not a source of sufficient inconvenience to render operative treatment necessary.

In the operation on the little and middle fingers in March, 1863, at which the late Mr. Ince assisted, I divided the digital prolongations of the fascia in the little finger in three places, when the contraction was overcome to about half its extent, and the digital contraction also of the middle finger yielded fairly well to fascial divisions. These fingers were afterwards straightened by the use of the finger instrument represented in Fig. 12. Both fingers remained straight, and with full power of flexion.

Four years afterwards this gentleman wished me to operate on the ring finger of the right hand in consequence of the increase of the contraction which had taken place, the tip of this finger now almost touching the palm of the hand, and as an officer it interfered with the drawing of his sword.

I operated upon this finger in July, 1867, dividing the fascia in three places, *viz.*: the prominent cord near to the transverse crease in the palm of the hand, and the digital prolongations in the finger. The contraction between the first and second phalanges was too severe to yield to the immediate extension prin-

ciple, and the finger instrument (Fig. 12) was afterwards used. At this operation Dr. Protheroe Smith administered his new anæsthetic, the tetrachloride of carbon; the patient became very violent at the time, and was in bed for two days with bilious headache, and a little jaundiced. The subsequent progress was slow, but the finger was nearly straightened in two months, when treatment was interrupted by the patient leaving England on urgent military duties.

Eleven years afterwards, in 1878, I had the opportunity of again examining this gentleman, and found that partial relapse had taken place in two of the fingers operated upon, but not to more than half the original extent.

In the ring finger of the right hand, the first phalanx has remained in a straight line with the metacarpal bone, but the contraction between the first and second phalanges—which was never completely removed—had relapsed, so that the second phalanx is flexed nearly to a right angle with the first. At the time of operation the tip of this finger nearly touched the palm of the hand. In the little finger of the left hand the contraction had relapsed to about half the original extent, and the lateral fascial band on the outer side was tense and well defined.

This gentleman informed me in 1879 that the phalangeal contraction of the second finger, as shown in the drawing, continued to increase, and four years ago he tore it open by hanging or holding on to the back of a coach whilst getting off. The finger was nearly straightened at the time of the accident; the wound healed favourably, but re-contraction afterwards took place, so that the finger became more bent than before the accident.

The partial relapse in this case did not necessitate any further operation, as both hands remained useful until the death of this gentleman, about five years ago. Drawing taken from a cast.

Fig. 2.—Dupuytren's contraction affecting the ring finger only, in the right hand—both palmar and phalangeal—of an officer in the army, about 70 years of age, showing a severe degree of contraction in the ring finger, to which the affection is almost limited; the little and middle fingers being only slightly contracted. A tense prominent cord, or fascial band, passed from the first phalanx towards the palm of the hand, and had been steadily increasing for many years. No operation was performed in this case, although from the inconvenience and annoyance often occasioned by the contracted finger, this gentleman was anxious to have an operation performed, and this was arranged to be done. It was interfered with, however, by frequent attacks of asthma, to which he is subject, and during these attacks the contracted finger is especially useful in enabling the patient to draw himself up in bed, by holding the head-rail of the bedstead, the time for treatment therefore could not well be given up. This gentleman died a few years ago. Drawing taken from a photograph.

Figs. 3 and 4.—Right and left hand of a medical man about 50 years of age, showing in the right hand a severe degree of Dupuytren's contraction in the little finger, from which a prominent fascial cord passed towards the palm of the hand, the skin of which was puckered and thickened, and its cavity appeared to be deepened by some contraction of the other fingers, as well as the thumb, which was drawn towards the palm.

In the left hand the contraction was chiefly limited to the ring finger, but extended in a moderate degree to the middle finger, the little finger not being at all involved. The skin in the palm of the hand was thrown into thick puckered folds, and the thumb was in some degree drawn towards the palm of the hand. This gentleman is of gouty diathesis, and the contraction, which had existed for many years, was steadily increasing. I commenced the treatment of this case by operating on the little finger of the right hand, but he was obliged to leave London for the North of England, where he resides, on the day of the operation, and as the immediate extension principle could not be fully carried out, the extension had to be made gradually by the instrument represented in Fig. 12. Although the treatment could not be carried out in this case in consequence of the pressure of professional engagements, there can be no doubt that the case, although one of great severity, is one admitting of further improvement. Drawings taken from photographs.

PLATE IV.

FIG. 1.

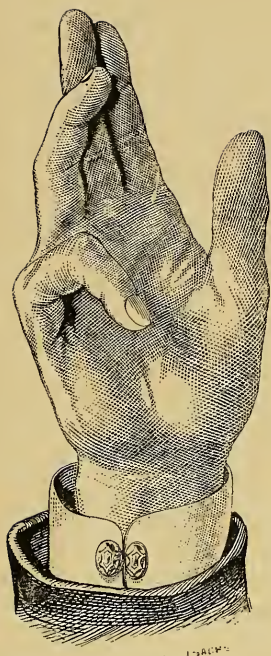


FIG. 2.

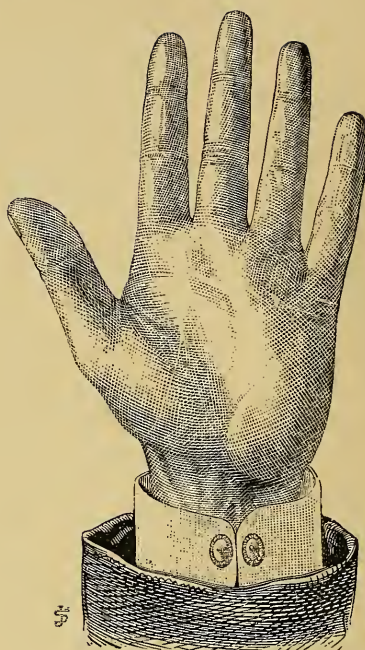
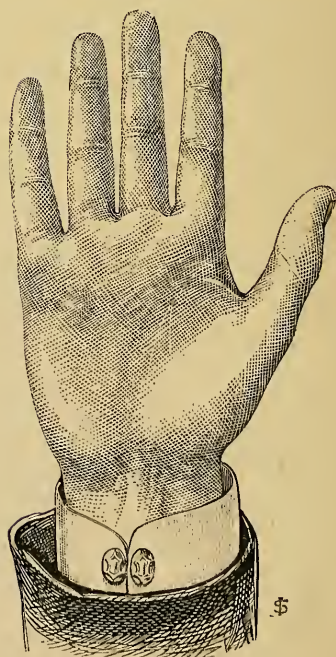
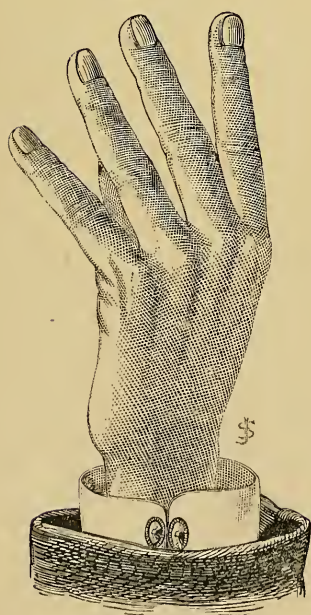


FIG. 4.

FIG. 3.



DESCRIPTION OF PLATE IV., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction involving chiefly the little finger, and to a less extent the ring finger of the right hand—both palmar and phalangeal—of a gentleman, æt. 33, upon whom I operated on the 31st December, 1878. In the little finger the second phalanx was flexed upon the first at a right angle, and the contraction was described as having commenced in a thickening in front of the first phalanx four or five years previously. The first phalanx was also drawn towards the palm of the hand by contraction of the digital prolongations of the fascia, and a sharp edge of a fascial band could be distinctly felt along the outer margin of the little finger and extending along the outer border of the palm of the hand. The contraction could not be attributed to the hand being used in any special manner, nor had this gentleman, who held a University appointment, been subject to gout, unless the dyspepsia, to which he was especially subjected, was of gouty origin.

At the operation on this case, at which Sir James Paget, whom the patient had previously consulted, was present, the immediate extension principle could not be fully carried out. After the contracted fascial bands had been divided in four or five places, the finger could not be brought much more than half way towards a straight line with the metacarpal bones; a small padded metal splint adapted to the curve of the finger was therefore applied, and on the fourth day gradual extension was commenced with the finger instrument represented in *Fig. 12*, and described at page 68. It took four weeks before the phalangeal contraction could be completely overcome, and even this rate of extension had to be slackened in consequence of the skin becoming thin, shiny, and attenuated. Drawing taken from a cast.

Fig. 2 represents the same hand as shown in *Fig. 1*, after one month's treatment. Both the little and ring fingers were perfectly straight, and a little irregular thickening of the skin only remains over the fascial contraction in the palm of the hand. I have not heard of any recontraction occurring in this case.

Fig. 3.—Dupuytren's contraction involving the middle, ring, and little fingers—entirely palmar—in the left hand of a gentleman, æt. 36, upon whom I operated on the 31st of December, 1878, the same day as the case represented in *Fig. 1*. The contraction had commenced eight or ten years previously, and gradually increased with thickening and contraction of the fascial bands in the palm of the hand, and their digital prolongations, drawing down the first phalanges in the fingers, without any contraction between the phalanges of the fingers, as shown in the previous case *Fig. 1*. This gentleman had, by the advice of one of the many surgeons whom he had consulted, been subjected to mercurial inunction until his system had become affected. Mechanical extension by an instrument similar to that represented in *Fig. 12* had been recommended, but it caused pain, and seemed to aggravate the contraction, so that its use was discontinued.

In this case the contraction could not be explained by the hand having been used in any special manner, and although of a gouty diathesis he had not previously been subject to any attack of gout; but two months after the operation when he was only wearing a retentive metal splint at night, he had a sharp attack of gouty swelling of the entire hand, as described at page 24. This was accompanied with lithic acid urine, and yielded to the alkaline treatment.

At the time of operation, in which I was assisted by my friend Mr. Alfred Cooper, whom he had previously consulted, four divisions of the contracted

fascial bands were made, and the fingers completely yielded to the immediate extension treatment, the first phalanges of the three fingers being brought at once on a straight line with their metacarpal bones. No other apparatus was necessary than the padded metal splint represented in Fig. 6, and on the tenth day the drawing showing the fingers completely restored to their normal position was taken, as shown in Fig. 4. Fig. 3 was taken from a drawing made previous to operation.

Fig. 4 represents the same hand as shown in *Fig. 3* in which the fingers were straightened completely at the time of operation. A little thickening of the skin, and dimpled depression alone remains at the seat of contraction in the palm of the hand, at a point corresponding to the transverse crease. Drawing taken from a cast.

I have seen this gentleman during the present year, 1891, and no recontraction has taken place. The fingers remain perfectly straight, and he has free motion and voluntary power.

PLATE V.

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.



DESCRIPTION OF PLATE V., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction of ring and little fingers in left hand—both palmar and phalangeal—in a gentleman, æt. 60.

This gentleman, who was devoted to literature as a profession, first consulted me with his medical attendant, the late Dr. Duplex, on the 9th June, 1880. He suffered from Dupuytren's contraction of the ring and little fingers in both hands. In the left hand the contraction was much more severe than in the right, especially the phalangeal contraction between the first and second phalanges in the ring finger; these were flexed at an acute angle, so that the tip of the finger was in contact with the palm of the hand. The little finger was contracted to a much less extent, but the thumb was a good deal contracted, and distinct bands leading towards the palm of the hand could be felt. His general health was undoubtedly good, and although dyspeptic, he was not considered to suffer from gout.

The contraction had existed for about ten years, and had increased of late. This gentleman had long been dissuaded from submitting to any operation; but from the increasing inconvenience, which rendered the hand practically useless, the open-wound dissection by Busch of Bonn, had been at last decided upon. Before going to Bonn, however, he was persuaded to try my subcutaneous operation.

On the 3rd July, 1880, I operated with the assistance of Professor Erichsen and Dr. Duplex. The contracted fingers were brought into a naturally straight position at the time of operation; and afterwards bandaged to a padded splint in a slightly flexed position. Extension was carried out as rapidly as it could be borne, and the result was most successful, with perfect use of all the fingers and thumb.

Fig. 2.—The same hand more than a year after operation. The fingers and thumb shown to be in a straight and natural position. Free movement and muscular power were fully restored. No defect whatever remained in this case, and no tendency to relapse occurred up to the death of the patient about two years ago.

Fig. 3.—Dupuytren's contraction involving the second finger only—both palmar and phalangeal—in left hand of a gentleman, æt. 52 years.

This gentleman, a merchant, first consulted me on the 20th October, 1882, for severe Dupuytren's contraction of the second finger of the left hand—both palmar and phalangeal—with a prominent cord in the palm of the hand, and a thick band between the first and second phalanges, so that the tip of the finger nearly touched the palm of the hand. No other fingers were involved.

The contraction commenced about eight or ten years ago, but had increased of late. Commencing contraction also of palm in right hand, leading to ring finger. This gentleman was of an undoubtedly gouty constitution.

On the 26th October, 1882, I divided all the contracted bands, and the finger was immediately straightened. The case proceeded very favourably, and the finger was completely restored to usefulness without any loss of muscular power.

Fig. 4.—The same hand from a cast taken on the 30th January, 1884. No disposition to recontraction appeared, and the fingers were fully restored to usefulness until his death from liver and kidney disease about three years ago.

PLATE VI.

FIG. 2.



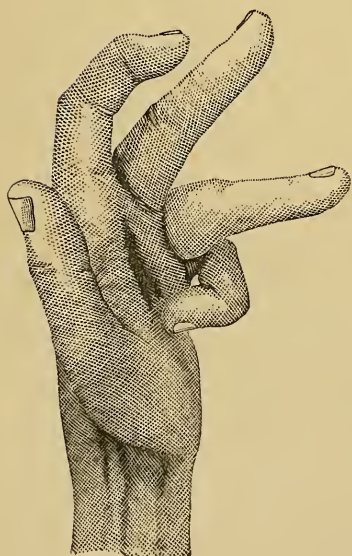
FIG. 1.



FIG. 4.



FIG. 3.



DESCRIPTION OF PLATE VI., WITH NOTES OF CASES.

Fig. 1.—Dupuytren's contraction involving all the fingers, and the thumb—both palmar and phalangeal—in the right hand of a naval officer, æt. 64.

This gentleman first consulted me on the 11th February, 1884, suffering from Dupuytren's finger contraction in its most severe form, affecting both hands.

In the right hand all the fingers and the thumb were involved in different degrees, and in the left hand, the index, middle, and little fingers, as well as the thumb, were involved, the latter being contracted to a much greater extent than in the right hand. This gentleman had every appearance of a strong vigorous constitution, without any marked gouty tendency. Although the finger contraction was not known to be hereditary, other cases occurred in the family, and his brother, an officer in the army, consulted me for a similar affection, but in a less severe form.

The finger contraction was attributed by the patient to extreme cold, and hard manual labour, especially in rowing and pulling for three days and nights in the year 1854, when he was engaged in the Arctic voyage in search of Sir John Franklin, in which he rendered distinguished service. From this time the contraction steadily increased.

In the right hand the thumb, index, middle, ring, and little fingers were all involved in Dupuytren's contraction—both palmar and phalangeal—the latter being in the most severe form, in the ring and little finger. In these fingers the first phalanx was contracted to a right angle with the metacarpal bone; the second phalanx was flexed at an acute angle with the first, and the third phalanx of each finger horned upwards by the introduction of pads to prevent the finger nail eating into the palm of the hand.

The second finger was only slightly involved by some palmar contraction as if drawn down by the other fingers. In the index finger a phalangeal contraction between the first and second phalanges had been steadily increasing, and brought the hand into a very useless condition, writing being most difficult, but, nevertheless, in his official position, more than a thousand signatures had to be written the day before the operation.

The contraction of the thumb had also been steadily increasing, and formed a complication both in the operation and the after mechanical treatment.

In spite of adverse professional opinions this gentleman submitted to my subcutaneous operation.

On the 27th February, 1884, I performed the first operation on the right hand, with the assistance of my colleague, Mr. Fisher. This was limited to the index finger, partly from the importance which the contraction of this finger involved from its interference with writing, and partly from the great difficulty anticipated in overcoming the phalangeal contraction of the ring and little fingers. All the contracted bands between and on either side of the first and second phalanges were divided, and the finger was at once brought into a nearly straight position, which the extension instrument rapidly completed.

On the 6th May, 1884, I performed the second operation with Mr. Fisher's assistance, and by numerous punctures and divisions of fascial bands succeeded in nearly straightening the ring and little fingers, but a good deal was left to be done by the extension instrument. The second finger, in which there was no phalangeal contraction, was at once straightened by division of one of the palmar bands.

The after treatment was unusually long and tedious, as I anticipated it would be from the severity of the case, its long duration and the phalangeal character of the contraction; moreover, the horning upwards of the third phalanx in both the ring and little fingers made a troublesome complication, requiring special mechanism, so that the after treatment occupied nearly seven months. In the end, however, the result was very perfect, both as regards position and voluntary muscular power, due very largely to the steady perseverance and determined will of a good patient.

Fig. 2.—The same hand three years after the operation completely restored to usefulness. The patient was kind enough to allow this cast to be taken on the 3rd January, 1887. All contraction in the *ring finger* has been completely removed, and there is no trace either of palmar or phalangeal contraction. In the *little finger* only a slight phalangeal contraction between the first and second phalanges remains. In the *index finger* also a slight phalangeal contraction appears on the cast, which was taken late in the afternoon, but in the morning, after wearing the retentive splints at night, there is no trace of this. In the *thumb* no trace of contraction remains.

In this gentleman's case the treatment of the left hand was undertaken three years after the right, and on the 7th January, 1887, I operated with the assistance of Mr. Macready. The ultimate result was equally favourable, but the phalangeal contraction, which was of extreme severity in the index and little fingers, gave a great deal of trouble. The thumb, in which the contraction between the first and second phalanges was very severe, yielded quickly, and gave no trouble. The acute angular contraction of the little finger could not be completely overcome.

Fig. 3.—Dupuytren's contraction involving all the fingers and the thumb, in the left hand of a clergyman, æt. 42—both palmar and phalangeal—the latter being of the most severe degree in the little finger, in which the three phalanges are involved.

This gentleman first consulted me on the 28th March, 1884, by the advice of Sir James Paget, who thought the subcutaneous operation offered the best chance of relief. He was suffering from Dupuytren's contraction in both hands—both palmar and phalangeal—most severe in the *left* in which all the fingers and the thumb were involved. The *little finger* in the *left hand* was the most severely contracted, the first phalanx being drawn down to a right angle with the metacarpal bone, the second phalanx at a right angle to the first, and the third at a right angle with the second, so that the finger nail was almost in contact with the palm of the hand. The *ring* and *middle* fingers were only drawn down to a moderate extent by a palmar band of contraction. The *index* finger was the seat of severe phalangeal contraction, more especially between the second and third phalanges, where the contraction, like that in the little finger, also commenced. The contraction between the first and second phalanges was to a less extent. The first phalanx was not at all drawn downwards, but remained in a straight line with the metacarpal bone. The *thumb* was contracted, but only to a moderate extent, the contraction being more palmar than phalangeal.

In the *right hand* the little finger only was contracted, and this was entirely phalangeal, and of recent date.

As to the *general health* and *family history*, this gentleman appeared to be in good health, though not robust, without any appearance of a gouty constitution. His grandfather and his mother were decidedly gouty, but this form of finger contraction was known to be hereditary. A younger brother, however, suffers from the same affection, and the contraction is also phalangeal in character.

In this patient's case the contraction is said to have commenced in the left little finger, when between 22 and 23 years of age, and possibly rowing in the University boat race might have induced it. The constitutional tendency, however—as shown in the late increase, the recent implication of the opposite hand, and a similar affection occurring in the brother—would exclude the local origin.

On the 29th April, 1884, I operated upon this gentleman, with the assistance of my colleague, Mr. Fisher. The contraction of the little finger gave way readily after division of the fascial bands, drawing down the first and second phalanges, but the contraction between the second and third phalanges yielded very little, and no fascial bands seemed to control it. The phalangeal contractions in the *index* finger yielded better, but not completely. The other fingers and thumb were easily straightened.

The after treatment was somewhat troublesome and tedious, but with a good patient who studied every point in his case, a very favourable result was obtained.

Fig. 4.—The same hand as shown in Fig. 3 five weeks after the operation. All the fingers are straight, except the third phalanx of the little finger, which could not be quite straightened, although after wearing the retentive splints at night, it was always so nearly straight that no fault could be found, but it would drop a little during the day, indicating the use of some simple form of retentive instrument.

This case is an interesting example of primary phalangeal contraction commencing in the little and also in the index fingers, in both of which the third phalanx was first drawn down—I can only call to mind three similar cases as regards the primary contraction of the third phalanx. One occurred in the brother of this gentleman; and one in a young medical man upon whom I operated on the 23rd September, 1887, and one in a young gentleman from Yorkshire, æt. 22, upon whom I operated June 1st, 1887. The early age at which all these occurred is worth noting.

In the course of five or six years a slight disposition to recontraction occurred in the finger which had been operated upon, but a considerable extension of the same mischief occurred to fingers and joints not previously affected in any marked degree. It was, therefore, *extension* of Dupuytren's contraction, and not *relapse* that I had to overcome, when he called upon me on the 13th January, 1890.

In the thumb phalangeal contraction had taken place to a considerable extent, and some increase in the palmar contraction. In the middle and ring fingers also severe phalangeal contraction had become developed, and in these fingers it had not previously existed. In the ring finger the palmar contraction had relapsed, but phalangeal contraction had also taken place. The third phalanx of the little finger which had never been quite straightened also became recontracted to a right angle with the second, but the first and second phalanges remained perfectly straight. In the index finger only a slight disposition to relapse was apparent, but the third phalanx had dropped a little.

On the 4th February, 1890, I operated upon this hand again, with the assistance of Mr. Macready, and the success at the time was complete, and I trust will remain so.

On the 2nd March, 1885, I operated upon the little finger of the right hand (the only one contracted) in this gentleman's case, and as it was of recent date, and not severe—though phalangeal in character—no difficulty was experienced in straightening the finger.

FIRST ESSAY.

ON DUPUYTREN'S CONTRACTION OF THE FINGERS,
AND ITS SUCCESSFUL TREATMENT BY SUBCU-
TANEOUS DIVISIONS OF THE PALMAR FASCIA,
AND IMMEDIATE EXTENSION.

FIRST ESSAY

ON DUPUYTREN'S CONTRACTION OF THE FINGERS, AND ITS SUCCESSFUL TREATMENT BY MULTIPLE SUBCUTANEOUS DIVISIONS OF THE PALMAR FASCIA, AND IMMEDIATE EXTENSION.

CONTRACTION of the fingers takes place from a variety of causes, and the pathological conditions will be found to vary, according to the nature of the producing cause; such, for example, as local injuries, with laceration of tendons; deep abscesses in the palm of the hand; burn cicatrices; gout; rheumatic gout, &c.

I now propose to direct attention to one form only, viz., *Dupuytren's finger contraction*, commonly met with in men about the middle, or beyond the middle period of life—rarely at younger ages. It seldom occurs in women, probably in the proportion of one in forty cases.

The contraction may affect one finger alone, in which case, according to my observation, the ring-finger is most frequently drawn down towards the palm of the hand. Some authors state that the

contraction most frequently commences in the little finger; having commenced in one finger, the adjacent fingers are in most cases gradually drawn down, though to a less extent. I have frequently seen the ring-finger severely contracted, so that its tip would nearly touch the palm of the hand, and the middle and little fingers contracted to about half this extent. I have seen the contraction in many cases limited to the little finger. The index finger and the thumb usually escape. But the thumb is more frequently involved than the index finger, and I have had to divide the contracted fascial bands connected with the thumb probably in about twenty cases. In Plate 3, Figs. 3 and 4, the thumb is shown to be slightly contracted, and in Fig. 3 it is severely contracted.

M. G. Goyrand, of Aix, records one case in which the thumb was contracted in the right hand of a man aged seventy-two, who died of apoplexy, at Aix, in November, 1834, and in whom Dupuytren's contraction existed in both hands, several fingers being drawn down in each hand.* M. Goyrand dissected the hands in this case, and has carefully recorded the appearances met with, which will be hereafter referred to.

I have now under my observation the case of a medical man in whom both thumbs are contracted in a marked degree, as well as some of the fingers in

* "De la rétraction permanente des doigts; nouvelles recherches sur la nature, les causes et le traitement prophylactique et curatif de cette infirmité," par le Docteur G. Goyrand, d'Aix, "Gazette Médicale de Paris," 1835. Tome III., p. 481.

both hands, as in the case above referred to. The skin on the palm of each hand is thickened, nodulated, and puckered by adhesion with palmar fascia.

When the contraction commences in the little finger, the ring-finger in some cases does not become involved, and the contraction being limited to the little finger, is explained by its dependence, in most cases, upon the contraction of a band of fascia extending along the outer margin of the finger from the outer border of the palm of the hand, as shown in Figs. 1, 2, and 3, and not upon the contraction of one of the four primary divisions of the fascia in the palm of the hand.

In these contracted fingers the articulations are generally in a healthy condition, though in some cases they are enlarged and altered in form, by rheumatic gout. The joints, however, can be flexed freely, but any attempt at extension is painful from the resistance offered, in severe cases, by a tense contracted cord passing from the finger into the palm of the hand, and to which the skin of the palm is closely adherent. The skin in the palm of the hand, near to the base of the contracted fingers is commonly drawn into thick knotty folds.

PATHOLOGY.

Dupuytren's account and his dissection.—The pathology and treatment of this form of finger-contraction always has been, and still is, the subject of much difference of opinion, and Dupuytren appears

to have been the first surgeon to investigate the anatomical conditions by dissection. In his "Leçons orales de Clinique Chirurgicale"* it is stated, "A man who for some time had been under the observation of M. Dupuytren, and was the subject of this deformity, died, and M. Dupuytren succeeded in gaining possession of the arm and hand. A careful drawing was made of the parts before the dissection. The whole of the skin was removed from the palm of the hand, as well as from the palmar surface of the fingers. The result was the complete disappearance from it of the folds into which it had been gathered. This opening out showed that its arrangement during the disease was communicated to it; but in what way or by what means was not evident. Continuing the dissection, the professor exposed the palmar aponeurosis, and was surprised to find it stretched, retracted, and shortened. From its inferior part were given off bands which passed to the sides of the affected finger. On making movements of extension in the affected fingers, M. Dupuytren observed that the aponeurosis underwent a kind of stretching and crackling. This threw light on the subject. It seemed clear that the aponeurosis was somehow

* "Leçons orales de Clinique Chirurgicale faites à l'Hôtel Dieu de Paris," par M. le Baron Dupuytren, recueillies et publiées par une Société de Médecins. Tome premier, Bruxelles, 1832, p. 5, article premier. "Rétraction permanente des Doigts par suite d'une affection de l'aponeurose palmaire."—An abstract of Dupuytren's observations will be found in "Selections from the Clinical Lectures delivered at the Hôtel Dieu, Paris, in the session 1831 and 1832, by Baron Dupuytren," *London Medical and Surgical Journal*, Vol. I., page 267, London, 1832, Renshaw and Rust.

connected with the deformity produced by the disease. The affected point remained to be discovered. The prolongations to the sides of the fingers were then divided; the contraction disappeared at once, and the fingers assumed their normal condition of one third flexion. The smallest force was now sufficient to bring them into a state of complete extension. The tendons were not implicated in any way, and their sheaths had not been opened. All that had been done was the removal of the skin, and the division of the bands of aponeurosis going to the bases of the phalanges.

“In order to remove all doubt and objections, M. Dupuytren dissected out the tendons. They retained their natural volume and mobility, as well as the smoothness of their surfaces. Continuing the examination, it was found that the articulations were in their natural condition, the bones not enlarged, roughened, or presenting in any way, either internally or externally, the smallest degree of change. No alteration was observed in the apposition of the articular surfaces, nor in their external ligaments; no ankylosis. Nor had the synovial sheaths, or the cartilages, or the synovial membranes undergone the slightest change. The conclusion naturally arrived at from these conditions, was that the starting point of the disease was the excessive tension of the palmar aponeurosis. As regards the cause of the palmar lesion, it was considered to result from injury to the aponeurosis caused by the too violent, or too prolonged action of some hard body held in the palm of the hand.”

Since Dupuytren made this important contribution to our knowledge of this affection, in the year 1831, it has sometimes been spoken of as Dupuytren's finger-contraction, a title as useful, as it is also a just compliment to the great surgeon, distinguishing it from all other forms of finger-contraction.

Goyrand's account and his dissection.— M. G. Goyrand,* of Aix, also records the dissection of the hands of a man seven-two years of age, who died of apoplexy in the year 1834, affected with this form of finger-contraction, and the description agrees very closely with that of Dupuytren, especially as to the tendons and their sheaths not being implicated in the contraction. M. Goyrand, however, regards the lateral bands extending along the phalanges, not as digital prolongations of the palmar fascia, but abnormal fibrous fasciculi, which extend from the fascia to the sheaths of the flexor tendons and the sides of the phalanges, into which they are inserted by their inferior extremities, extending sometimes from the first to the second phalanx. He also describes transverse fasciculi connecting the longitudinal bands; and considers Dupuytren's opinion, that the palmar fascia alone was the cause of the contraction, to be erroneous.

Partridge's dissection in King's College Museum.— In the Museum of King's College, is a dissected specimen of one of these finger contractions, No.

* "Gazette Médicale de Paris," 1835, p. 481; also "Mémoires de l'Académie Royale de Médecine," Tome III.; and "Gazette Médicale," 1834, p. 219.

1444-3, presented by the late Professor Partridge, (see Figs. 1 and 2). In this specimen the contraction is limited to the little finger, and shown to depend upon a strong contracted band of the palmar fascia *a*, by which the finger is drawn towards the palm

FIG. 1.

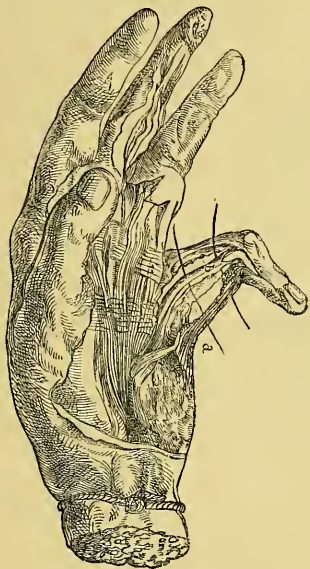


FIG. 2.

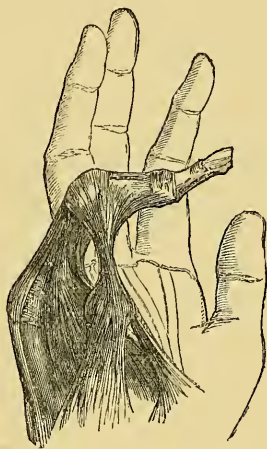


Fig. 1.—Dissection of contraction of little finger, showing contraction to depend upon the Palmar Fascia alone; from specimen in Museum of King's College. *a*. Contracted Band of Palmar Fascia stretching across like string of the bow; *b*. Flexor Tendons lying deeply along the concavity of the curve, close to the bones.

Fig. 2.—Another view of same dissection as Fig. 1. showing contraction to depend upon a band of the Palmar Fascia. (From *Druitt's Surgeon's Vade Mecum*. Eleventh Edition, Fig. 301 J. & A. Churchill, London, 1878.)

of the hand, the facial band stretching across, like the string of a bow, and passing along the outer side of the little finger, along the first phalanx, to the beginning of the second. The flexor tendons *b*, Fig. 1, are in no degree implicated in the contraction, and may be seen deeply in the concavity of the curve

in their normal relation to the bone, *i.e.*, in the dense tubular sheath by which they are closely bound down to the phalanges, along their entire length, between the articulations.

This dissection has also been figured in Druitt's "Surgeon's Vade Mecum," eleventh edition, p. 301, and

FIG. 3.



Cast from Hand represented in Figs. 1 and 2, previous to dissection in Museum of King's College.

I am indebted to Dr. Druitt for permission to reproduce it here (see Fig. 2). In this drawing, the direction and relations of the contracted band of the palmar fascia are more distinctly shown, but the relation of the fascia to the tendons had not then been demonstrated by dissection. I improved

the dissection to this extent at the time when permission was given me by the Museum Committee, in October, 1877, to examine the specimen and have the present drawing made. In Dr. Druitt's woodcut the artist has failed to reverse the drawing on the block, so that it has the appearance of being drawn from a right hand; but the dissection and the cast both show it to be the left.

There is also a cast in the Museum (see Fig. 3), apparently taken from the same subject previous to the dissection, as it corresponds in all respects with the contraction of the little finger, and shows the lateral direction of the contracted fascial band. This cast has no number, but is engraved June, 1853, and I am informed by Mr. Barnard, the curator of the Museum, that Mr. Partridge always used it in lecture, together with the dissection.

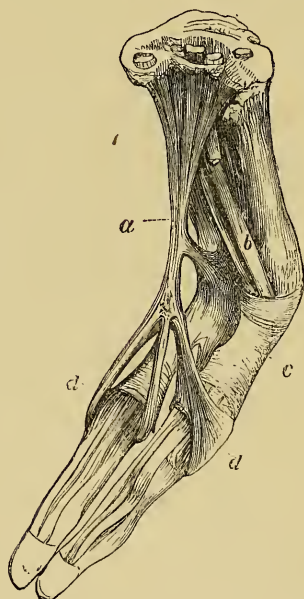
Dissection in Museum of St. Bartholomew's Hospital.
—In the Museum of St. Bartholomew's Hospital there is also a dissected specimen of Dupuytren's finger-contraction affecting the middle and ring-fingers (No. 1203). In the catalogue,* this specimen is described as "part of a hand in which the middle and ring-fingers were permanently flexed, in consequence of the thickening and contraction of the portions of the palmar fascia connected with them." I am indebted to my friend, the late Mr. James Shuter, for directing my attention to this specimen, the existence of which I was not previously

* "Descriptive Catalogue of the Anatomical Museum of St. Bartholomew's Hospital." Vol. i., p. 177. London: Churchill, 1882.

aware of. A very accurate drawing has been made by Mr. Godart, the artist to the hospital, and is represented in Fig. 4.

In this specimen the palmar fascia is seen as a firm, tense, prominent cord *a*, stretching, like the

FIG. 4.



Dissection of Finger Contraction, affecting middle and ring fingers, showing contraction to depend upon the Palmar Fascia alone; from specimen in St. Bartholomew's Hospital Museum. *a*. Contracted band of Palmar Fascia stretching across like string of a bow; *b*. Flexor Tendons lying deeply along the concavity of the curve, close to the bones, and bound down along the first phalanges of the fingers by the dense tubular sheath *c*, through which they pass. *d*. Digital prolongations of Palmar Fascia, extending to articulation between first and second phalanges in each finger.

string of a bow, between the palm of the hand and the contracted fingers, whilst the flexor tendons *b*, are seen lying at a depth, and pursuing their natural course along the concavity of the curve in close proximity with the bones, and over the first phalanx

bound down by the dense tubular sheath *c*, which they enter opposite the metacarpo-phalangeal articulations. The digital prolongations of the palmar fascia *d*, in this specimen, and also in the specimen in King's College Museum (see Figs. 1 and 2), appear to have been to some extent dissected away from their attachment to the bone along the lateral margin of the first phalanx, and thus made to appear to have their insertion on either side of the articulation between the first and second phalanges of the fingers. In both these preparations, therefore, the digital prolongations of the palmar fascia appear to flex the fingers and draw them towards the palm of the hand, by acting upon the articulation between the first and second phalanges, which does not correspond anatomically to their normal insertion; but I imagine this arises from their normal insertion along the margins of the first phalanx having been to some extent dissected away, and the insertion of these digital prolongations therefore, apparently, carried further down the fingers than they would be in their natural condition, although the digital prolongations may be traced beyond the articulation on to the second phalanx.

In the St. Bartholomew's specimen, it is specially worthy of remark that in both contracted fingers the second and third phalanges remain in a line, continuous with that of the first phalanx, which alone is flexed towards the palm of the hand, *i.e.*, the second phalanx is not bent upon the first, or any angle of flexion formed between the first and

second phalanges. It is evident, therefore, in this case, which is a typical example of simple palmar contraction, that a division of the contracted fascia would immediately have restored these fingers to their normally straight line with the metacarpal bones. Whilst on the other hand, in the King's College specimen, the little finger is drawn down, not only by the flexion of the first phalanx, but the second phalanx is bent upon the first, so that a sharp angle of flexion is formed at the articulation between the first and second phalanges. This is caused by the contraction of some fibres of the digital prolongations of the fascia, extending laterally from the first to the second phalanx, and thickened in the neighbourhood of the joint. This is therefore a typical example of the mixed form of contraction, viz., palmar and phalangeal combined.

Practically, I have found this in some cases a very difficult condition to overcome, and some degree of contraction between the first and second phalanges may remain, and require separate treatment, after the flexion of the first phalanx has been completely restored to a straight line with the metacarpal bone.

The Author's case, in which the parts were exposed by accident.—It has never occurred to me to have the opportunity of dissecting one of these finger contractions; but on the 15th of April, 1864, a gentleman, Mr. L., æt. 50, residing at Hampton Court, who suffered from Dupuytren's contraction of the fourth and fifth fingers in each hand, and upon whom I had proposed to operate, met with an accident. In attempting to

hold a restive horse, the contracted fingers on the right hand were suddenly torn open, and the skin in the palm of the hand torn across. I saw him shortly after the accident, when the hand had been merely tied up by a handkerchief, and found a large gaping wound in the palm reaching nearly half way across. The palmar fascia had been torn across, together with the skin, but the sheaths of the tendons were not torn, and it was evident that these structures had not been implicated in the contraction. The tendons in their sheaths were seen lying at a depth from the surface, running along the concavity of the curve, in proximity with the bones, whilst the fascia had evidently been stretched across like the string of a bow. After cutting away a few torn threads of fascia, I found, on attempting to extend the fingers, that the previously transverse wound assumed a lozenge-shape in a perpendicular direction. I therefore approximated the edges laterally and introduced sutures, so that when sewn up it resembled a longitudinal, instead of a transverse wound. The hand was firmly bound round with narrow strips of plaster, and bandaged to a splint with the fingers in an extended position. On the third day the wound presented a healthy appearance, without any suppuration, and I therefore removed the sutures. The healing process proceeded without interruption, and the fingers remained nearly straight, without their power of flexion being lost. This gentleman has since died, but no recontraction had taken place.

When the first edition of this essay was issued in

1879, these so far as I knew were the only facts we could appeal to for the anatomical conditions presented in Dupuytren's finger contraction, but since that time some dissections have been made demonstrating the anatomical condition of the parts, with the general result of confirming the accounts originally given by Dupuytren and other observers previously referred to.

The most recent contribution is that made by my colleague, Mr. C. B. Lockwood, and brought before the Pathological Society, November 17th, 1885, and published in the *Transactions*, Vol. xxxvii., p. 556.

Mr. Lockwood's specimen was obtained from a subject in the dissecting room, and showed a marked flexion of the ring, and little fingers of the right hand. In the dissection it was "perceived that a very thick (one eighth of an inch) band of palmar fascia ran from near the annular ligament of the wrist to the fork between the ring and little fingers, where it bifurcated sending a slip to each. These digital slips blended with the deep fascia and skin of the finger, and formed intimate connections with the lateral digital septa, the ligaments which pass from the phalangeal edges to the skin (Cleland's ligaments) and with the fibrous capsule of the proximal interphalangeal joints. The contracted band of the ring finger was the thickest and most prominent, and owing to the fact that the vessels and nerves were not raised with it, an interval of quite a quarter of an inch separated it from them. The vessels and nerves would not have been divided by an operation per-

formed with ordinary skill. The contracting band which went to the little finger was but slightly prominent, and the digital vessels and nerves were close to it."

Other dissections have also been made, and Dr. Keen in his able article in "Wood's Reference Hand-book," says, "there have been now recorded more than a dozen dissections of such hands"; but he only gives precise references to two, and observes, "The most recent dissection, I believe, is that by Ménard and Variot (Chevrot, Thèse de Paris, 1881) in which the microscopic examination also is reported. Richet (*Prog. Med.* 1877) also has reported a case with the only other microscopic examination, which confirms this. The palmar fascia was tripled in thickness, with slight thickening of the epidermis and derma; disappearance of the fatty tissue: a dense fibrous tissue resembling cicatricial tissue, interposed between the skin and the aponeurosis, binding them together, or rather confounding them in a single layer, so intimate that the scalpel only could separate them, and finally a thickening of the sudoriparous glands. The cartilages of the joints, where they were in contact, were normal, but were eroded and yellowish at the posterior part of the heads of the metacarpal bones.

All the dissections agree in negating the supposition that the tendons, or sheaths of the tendons, are involved in these contractions. This is also confirmed by my own clinical experience, as I have invariably found that after dividing subcutaneously a tense and prominent cord—which has generally been

mistaken for a tendon—in the palm of the hand, the patient is able to flex the finger as strongly as before the operation, at once disproving the opinion often expressed by surgeons, that such fingers will remain stiff and inflexible after the operation. A gentleman, Captain L., upon whom I operated many years ago, was well known as a good flute player, and within a few months of the operation, which was completely successful in straightening the ring-finger, he was enabled to play the flute as well as ever.

The late Sir William Fergusson, in the last edition of his “System of Practical Surgery,”* gives at page 259, a drawing (Fig. 135) of the particular form of finger-contraction we are now describing, and observes: “At first sight, in such a case as this, (well displayed in the drawing) the flexor tendons seem to be the cause of this distortion.” After alluding to the opinions of Goyrand and Dupuytren to disprove this, he states: “In all instances where the contraction has been extreme, it has appeared to me that the skin, cellular tissue, fascia, and even tendons, have been more or less in such a state of permanent rigidity as to prevent the extension of the fingers; indeed, I have observed in the dissecting-room, that in cases of old standing, when all the textures were removed, with the exception of the ligaments, the fingers could not even then be stretched out without force, and that they immediately afterwards, unless when the ligaments were torn, resumed their crooked position. In

* “A System of Practical Surgery,” by Sir William Fergusson, Bart. Fifth Edition. London: Churchill, 1870.

some cases, I believe that one or other of the textures above named may be more in fault than the rest, and in others, that even the lumbricales and interossei are in part the cause."

Anatomical impossibility of the flexor tendons being involved in the contraction.—The impossibility of the flexor tendons being involved in Dupuytren's contraction of the fingers, will, I think, become apparent to any surgeon after an attentive examination of the anatomical relations of the flexor tendons to the fascia, and to the bones at the parts where the most prominent contracted cords usually exist, viz. : *first*, in the palm of the hand, at a spot corresponding to the transverse flexion-furrow, where the most tense and prominent solitary cord generally exists, as shown in Plate 1, Figs. 1 and 3, and others ; and *secondly* in the neighbourhood of the cutaneous web between the fingers, where the smaller, but very resisting contracted bands of fascia are always met with, and are directed towards the sides of the phalanges. At these two spots, we have then particularly to study the anatomical relations of the flexor tendons to the fascia, and to the bones.

First with regard to the transverse flexion-furrow in the palm of the hand—by this I mean a transverse crease, which on flexion of the fingers is converted into a deep furrow, passing transversely across the palm of the hand, rather more than an inch above the margin of the cutaneous web between the fingers. This transverse crease, or furrow, is no doubt produced by the habitual flexion of the fingers

upon the palm of the hand, and will be found to be more conspicuous in proportion to the hand-labour performed. It will also be observed that in many persons, especially those less accustomed to manual labour, the flexion-furrow of the index finger curves upwards towards the central part of the palm of the hand, whilst the flexion-furrow belonging to the three outer fingers curves downwards towards the cutaneous web between the index and middle fingers. This deviation from the continuous transverse line is no doubt due to the more independent habitual flexion of the index finger, as well as to the fact that the three outer fingers are more habitually flexed together in the ordinary movements of the hand.

The main point, however, in reference to our present subject, is that this transverse crease, or flexion-furrow, precisely corresponds to the metacarpo-phalangeal articulations, and that if a needle were entered at this transverse furrow on the palmar aspect, it would in transfixing the hand, pass through the metacarpo-phalangeal articulation.

Now, we know as an anatomical fact, that the flexor tendons of the fingers enter their dense tubular sheath on the palmar aspect of the first phalanx, just at the margin of the metacarpo-phalangeal articulation, as well shown in Fig. 4, *b* and *c*, from preparation in St. Bartholomew's Hospital Museum, and continue their course along the finger in close proximity with the bone, so that a needle transfixing the hand from the transverse flexion-furrow in the palm, very closely indicates the spot at which the flexor tendons enter their dense tubular sheath.

From this dense tubular sheath no anatomist would believe the flexor tendons could be dislodged by any traction-power exerted by contraction of the palmar fascia, yet the spot at which the tendons enter the sheath also corresponds to the most prominent part of the large solitary contracted cord observed in the palm of the hand, marked *a* in Fig. 4, and it will be seen that no such displacement has occurred in the case represented.

Reasoning, therefore, from these anatomical facts, we can only conclude that the tense solitary cord in the palm of the hand must be one of the four large sub-divisions of the palmar fascia into which it divides, and which pass towards the four outer fingers, as far as the metacarpo-phalangeal articulations; and it is therefore impossible that the flexor tendons of the fingers could be reached, or divided, by the surgeon when he divides the tense solitary cord in the palm of the hand with ordinary care.

Secondly.—Opposite the metacarpo-phalangeal articulations, the four great sub-divisions of the palmar fascia are connected by transverse bands, and then they subdivide into the digital prolongations, which pass on either side of each finger towards their insertion into the bone of the first phalanx, external to, and along the margins of, the dense tubular sheath enclosing the flexor tendons.

The insertion of the digital prolongations of the fascia into the periosteum of the first phalanx is not accurately described in many anatomical works, the insertion into the sheaths of the tendons being more

generally recognised. Professor Curnow, of King's College, is in the habit of directing the attention of his class especially to the insertion of the digital prolongations of the palmar fascia into the periosteum of the first phalanx, external to, and along the borders of, the sheath of the flexor tendons.

I have satisfied myself of the accuracy of this by my own dissection, and have seen it admirably displayed in the dissections used by Dr. Curnow.

It appears to me that the drawing down of the first phalanx is satisfactorily explained, when the insertion of the digital prolongations of the fascia into the periosteum is borne in mind.

It will thus be seen that above and below the transverse flexion-furrow in the palm of the hand, we have important differences in the anatomical arrangement of the palmar fascia; above this line we have the four great sub-divisions of the palmar fascia, proceeding centrally towards the four outer fingers; and below the line towards the fingers we have the digital prolongations of the fascia proceeding laterally to the sides of the phalanges.

The tense solitary cord frequently seen above the transverse flexion-furrow, and represented in Plate 1, Figs. 1 and 3, might well, from its situation, direction and thickness, be mistaken for one of the flexor tendons; and in my earlier operations I divided it in the belief that it was a tendon, or at least that the tendon and its sheath, as well as the palmar fascia, were involved in, and contributed to form the tense contracted cord. The after-treatment, by gradual

mechanical extension, as practised in tenotomy, was also based upon this supposition, which I have now satisfactorily proved to have been erroneous. It was the conviction of this error which led me to abandon the method of gradual mechanical extension, and adopt the plan of immediate extension advocated in the present paper.

This conviction was brought to my mind in the year 1864, when I had the opportunity of carefully examining the anatomical relation of the parts involved, in the case of a gentleman, Mr. L. previously referred to (page 12), who met with an accident by which the skin and the contracted palmar fascia were torn across without the flexor tendons being injured, and the tendons in their sheaths were seen lying at a depth from the surface, in proximity with the bones, whilst the fascia had evidently been stretched across like the string of a bow.

Origin and Progress of the Contraction.—The commencement of this form of contraction is sometimes to be traced in one hand in patients in whom the contraction exists in a severe form in the other, and I have watched its commencement from a flattened nodular induration of the palmar fascia, in, or just above the transverse crease in the palm of the hand, corresponding to the metacarpo-phalangeal articulation. In the beginning, the skin is not adherent to this flattened induration; but in one case, now under my observation, the commencement of a fascial cord-contraction can be traced, leading from the transverse crease to the little finger in the left hand, a spot certainly not exposed to pressure.

In the *second* stage the skin becomes adherent to the thickened fascia, and a puckered dimple is produced, extending from which, towards the finger, a thickened band of fascia can be distinctly felt.

The *third* stage consists of an increased thickening of the palmar fascia, and the band leading to the finger; and also the formation of a thick cord-like band of fascia, leading upward from the central thickening towards the annular ligament of the wrist, accompanied with a gradually increasing drawing down of the finger, or fingers, towards the palm of the hand. Such I believe to be the gradual progress of the fascial contraction and its adhesion to the skin, in the great majority of cases of Dupuytren's finger-contraction.

In some cases, and especially those in which the second phalanx is sharply flexed upon the first, the contraction appears to commence in thickening of the digital prolongations of the palmar fascia along the first phalanx. Patients describe the commencement as apparently thickening induration of the skin over the first phalanx; they also then describe the second phalanx as becoming flexed upon the first, and last of all the finger being drawn down to the palm of the hand, often somewhat rapidly, so that the tip of the finger may touch the palm of the hand in about two years. In these cases, therefore, the extension of the thickening of the digital prolongations of the fascia would appear to extend downwards from the first to the second phalanx, and lastly upwards to the larger fascial bands in the palm

of the hand. In a few cases I have seen the contraction begin between the first and second phalanges, without any marked thickening or contraction in the hand.

CAUSE, *Local and Constitutional*.— With regard to the cause of this affection, most authorities agree in assigning it, in the great majority of cases, to a local cause, and believe it to be produced by pressure from the tools employed in various occupations; and it is said that carpenters, gardeners, and gunners are specially liable to it. Sir James Paget* refers to the elder men occupied in wire-drawing, and lock and key making, as being subject to this condition. It is also thought that rowing, pressure from the whip-handle in driving, and other causes of local irritation might produce it.

Sir William Fergusson† observes: “It has been asserted that those who are so employed as to cause much pressure on the palm of the hand (such as carpenters, gardeners, gunners, &c.) are more subject to this condition than others; it may be so, but the figure above exhibited (Fig. 135, a good illustration of Dupuytren’s contraction affecting the ring and little fingers, W.A.) was from an individual who had been less occupied in this way than most people, and I have again and again seen the fingers thus distorted in parties who never had occasion to put their hands to any kind of rough work.”

It is also generally admitted that this form of contraction may take place from constitutional causes, independently of any local cause, and that it is then

* *British Medical Journal*, 1875, Vol. I., p. 666. † *Op. cit.*, p. 259.

generally traceable to a gouty diathesis. Sir James Paget, in the clinical lecture above referred to, points out the dependence of this contraction in some cases upon the gouty diathesis, and believes that the adhesion of the palmar fascia to the adjacent sheaths of tendons, and the integuments, forms a point of diagnosis. My own opinion is, that it always depends upon a constitutional, rather than any local cause, and essentially I regard it as depending upon a gouty diathesis.

In the cases which have fallen under my observation there have been generally other manifestations of a gouty tendency, more especially to that form we recognise as rheumatic gout, affecting several articulations, and often causing enlargement of the joints of the fingers, rather than true inflammatory gout affecting the great toe. In the majority of cases we are able to trace a well-marked family history of gout, although the patients suffering from contraction of the finger, in many instances, have not themselves suffered from gout in any form.

It is also worthy of remark that in two instances, patients upon whom I have operated for contracted fingers—cases represented in Plate 2, Fig. 2, and Plate 4, Fig. 3—had both an attack of gouty swelling of the hands after the operation. The gentleman whose case is represented in Plate 2, Fig. 2, had an attack of gouty swelling of the hand three weeks after the operation, towards the end of treatment, when the finger was nearly straightened. He had not a family history of gout, and, at first, said he had never suffered from

gout, but afterwards remembered he had suffered from severe and painful inflammation of one eye, which the oculist told him was of a gouty character. In the other case, represented in Plate 4, Fig. 3, a sharp attack of gouty swelling of the entire hand occurred two months after the operation, when the cure was complete. Indeed, in this case, as the contraction was entirely overcome at the time of operation, and the immediate extension principle succeeded, no after mechanical treatment was necessary beyond the application of a retentive metal splint.

In one of the cases also mentioned by Mr. Cæsar Hawkins, a coachman, æt. 39, with finger contraction in both hands, Mr. Hawkins was obliged to defer the operation in consequence of the patient being attacked with gouty inflammation in several joints successively.

In favour of this opinion, that the finger-contraction depends upon constitutional rather than local causes, I would refer; *First*, to the class of patients in whom it occurs. During a connection of more than twenty years with the Royal Orthopædic Hospital, I saw but few cases of Dupuytren's contraction in the labouring class, and have failed to obtain evidence of its frequent occurrence amongst any particular class of mechanics; whilst the cases that did present themselves, generally occurred in butlers and in-door servants.

It seems, however, to be an affection of common occurrence in the middle and upper classes of society. The cases which have fallen under my observation have generally occurred in clergymen, barristers,

medical men, officers in the army and navy, and merchants; the only condition common to a great majority of the cases being a disposition to gout, co-existing with the finger contraction.

Secondly.—I would refer to the frequent occurrence of this affection in the left hand only, and to its occurrence in both hands, which we could hardly explain by any local cause.

Thirdly.—I would refer to the fact that in several instances I have known two brothers suffer from it, and in some cases the father and son, and in one instance three generations have been similarly affected, illustrating its hereditary tendency. For these reasons I am disposed to attach far greater importance to the constitutional, than any local cause.

Theory of neurotic origin.—An important contribution to the pathology of Dupuytren's finger-contraction in reference to the theory of its causation has been made since the publication of my treatise by Dr. Robert Abbé of New York, who has endeavoured to prove that this affection is of neurotic origin, and he has illustrated his observations by a series of remarkable cases.*

As this theory of Dr. Abbé's made a prominent subject of discussion in the paper I read at the Medical Society of London, 24th March, 1890, and which is reprinted at the end of the present essay, I

* Dr. Abbé's first paper was read before the New York Academy of Medicine, April 17th, 1884, and published in the *New York Medical Journal*, April, 19th and 26th, 1884. Dr. Abbé's second paper was read before the Surgical Section of the Academy of Medicine, February 13th, 1888, and published in the *Medical Record*, March, 3rd, 1888.

will not now refer to it further than to say that it has not altered my own views with regard to the gouty origin, and I am disposed to agree with Dr. W. W. Keen, of Philadelphia, that "Abbé's theory of nervous origin seems to me only probable in so far as gout and rheumatism are possibly nervous in their remoter origin."*

TREATMENT.

With regard to the treatment, this must be either mechanical, or operative, and although operative treatment is always required in severe cases, there can be no doubt that gradual mechanical extension, by an apparatus worn night and day, might in slight cases prevent increase of the contraction.

GRADUAL MECHANICAL EXTENSION.

When the cure of this affection is attempted by the process of gradual mechanical extension, the extending force should be lightly applied, and constant, not intermittent. When patients have endeavoured to overcome the contraction by wearing a steel instrument along the back of the hand and finger, only at night, they frequently complain not only of the pain occasioned by the extension, and the painful stiffness remaining the next day, but also state that the contraction appeared to increase afterwards, and under the belief that the extension aggravated the contraction it has frequently been abandoned.

* *Wood's Reference Hand-book of the Medical Sciences*, article "Fingers, contraction of."

If, however, the extending force be lightly and constantly applied day and night for several months, as my late colleague, Mr. Tamplin, used to apply it, there can be no doubt that slight contraction may, in some cases, be overcome. But in severe cases, and in those of long standing, mechanical treatment is useless, and by causing pain often appears to aggravate the contraction; the only prospect either of benefit or cure being from operative treatment, either by open-wound, or the subcutaneous method.

OPERATIONS BY OPEN WOUND.

Dupuytren's Operation.—Dupuytren, in the year 1831, divided the contracted palmar fascia by open-wound, making an incision ten lines in length, and in his "*Leçons orales*,"* the following observations are made, describing the case first operated upon by him.

"The various theories set forth as to the etiology of this distortion, have necessarily given rise to much uncertainty as regards modes of treatment. Many surgeons have believed the disease to be beyond the resources of their art. Dr. Bennati consulted Astley Cooper in the case of an Italian named Ferrari, the subject of this deformity, and was told by this celebrated English surgeon that the deformity was incurable; other surgeons, who admitted its curability, laid down rules of treatment which proved inefficacious. M. Dupuytren, in treating several

* "*Leçons orales*," par M. le Baron Dupuytren. Tome I., p. 3. Bruxelles, 1832.

cases of contraction of the ring-finger, has employed one after the other atomised fumigations, emollient to begin with, and afterwards soothing. Plasters applied during the day-time, and sometimes at night, leeches, friction with absorbent ointments, especially mercurial ointment and calomel. In addition to these means he has resorted to the use of alkaline, simple, sulphurous, and saponaceous douches, administered at various temperatures, without obtaining any results. As a last resource, M. Dupuytren ordered Lacroix to make an instrument by which permanent extension might be secured. However, no amelioration was produced by the instrument; on the contrary, it caused such intense pain in the palm of the hand, when the extension was kept up too long, that its use was abandoned. Some surgeons proposed division of the flexor tendons. This operation has been performed twice. The result in one case was inflammation and mortification along the sheath; the patient's life was endangered, and the finger remained flexed. In the other case the division was practiced lower down; no complications arose, but it remained flexed as before. Some time after these operations had been performed, and by excellent surgeons, Dupuytren was consulted in a similar case by Dr. Maily*. . . . The operation was performed June 12th, 1831, assisted by MM. Maily and Marc, in the following manner. The hand of the patient being firmly fixed, he (Dupuytren) commenced by making a transverse incision, ten lines in length,

* *Op. cit.*, p. 8.

opposite the metacarpo-phalangeal articulation of the ring-finger, the bistoury divided first the skin, then the palmar aponeurosis with a crackling noise audible to the ear. The incision completed, the ring-finger straightened, and was as easily extended as in the natural state. Wishing to spare the patient the pain of a fresh incision, Dupuytren endeavoured to extend the section of the aponeurosis by gliding the knife transversely, and deeply, under the skin towards the cubital (thumb) border of the hand to accomplish the disengagement of the little finger, but in vain; he was only able to partially extend the incision of the aponeurosis. Consequently, he determined to make a fresh transverse incision opposite the articulation of the first and second phalanges of the little finger, and thus detached its extremity from the palm of the hand, but the rest of the finger remained flexed towards this part. He then divided the skin from the aponeurosis by a fresh incision, opposite the articulation of the corresponding metacarpo-phalangeal joint. This produced a slight relaxation, but its effects were incomplete. At length a third, and last, incision was made transversely, opposite the middle of the first phalangeal joint, and the little finger was at once able to be extended with the greatest ease. This result distinctly showed that the last incision had divided the point of insertion of the aponeurotic digitation. Very little blood was lost by these incisions, and was stopped by dry charpie; the ring and little fingers were placed in extension by the aid of an appropriate

instrument fixed on the back of the hand. The day of the operation, and the following night, there was little or no pain. Only slight inconvenience was caused by the continual extension. The following morning the back of the hand was slightly swollen, the result of the compression of the instrument, which was constructed rather clumsily, and by an unskilful maker. On the morning of the 14th a new instrument of M. Lecrox, consisting of a half-cylinder of cardboard terminated by four metallic ends, which could be lengthened or shortened at will, and mounted by a kind of thimble to embrace the ends of the fingers was applied. The patient appeared at first to experience relief, but in the evening the irritation re-appeared, the pain re-doubled, and the hand was invaded by a universal swelling. Then, without removing the extension instrument, Dupuytren ordered the hand to be continually irrigated with a solution of cold water and acetate of lead. Under the influence of these frequent ablutions, the pain and tension diminished, and the condition of the patient became more endurable.

“On the 15th the charpie was removed and suppuration was commencing. The hand was still engorged, and there was a painful tension felt throughout the extent of the extended fingers. The extension was maintained to the same degree, and the lead lotions continued. On the 16th there was only slight swelling of the hand, and stiffness in the fingers. Suppuration was completely established. On the 17th the symptoms had diminished

in intensity, and the extension of the fingers was able to be increased several degrees without causing pain. Finally, on the following days, the swelling and tension disappeared, and the edges of the wound commenced to cicatrize, slowly, indeed, on account of the separation produced between their lips by the forced position in which the hand was purposely maintained. Nevertheless, by the 2nd of July cicatrization was complete. The manner in which it occurred deserves notice; it followed a progression *pari passu*, with the different degree which the extension exercised on each of them. Thus one saw successively heal *first*, that wound which corresponded to the articulation of the first and second phalanges of the ring-finger: *secondly*, the wound opposite the middle part of the first phalanx; *thirdly*, the wound in relation to the articulation of the metacarpo-phalangeal joint of the little finger; *fourthly*, and lastly, the wound which had been first made, and which corresponded to the metacarpo-phalangeal articulation of the ring-finger. Moreover, the patient retained the use of the extension instrument for more than a month in order to prevent the re-union of the borders of the divided aponeurosis, and to obtain isolated cicatrization. When the instrument was removed, the patient could easily flex the fingers, and was only inconvenienced by the stiffness resulting from the continued extension of the joints. This stiffness disappeared as soon as the patient was permitted free movements of his hand. On the 2nd of August Mr. L. only wore the extension instrument

at night, and the joints already began to enjoy freedom of movement, which inclines one to think that the use of the flexor tendons had remained intact, and that in a short time the natural movements of the fingers would be restored.

“The above case leaves no doubt as to the cause of the disease; the opinion of Dupuytren is then the only correct one, and the one which rightly interprets the existing conditions. But how could the palmar aponeurosis cause the above results? A short description of this fibrous envelope will explain it. The palmar aponeurosis, in its superficial part, arises from the opening out of the tendon of the palm, and the prolongation of the anterior ring ligament of the carpus. At first very strong at its origin, it gradually diminishes as it advances, so that it gives rise towards its inferior border to four large fibrous bands directed towards the lower extremity of the last four metacarpal bones. There each of these bands bifurcates for the passage of the flexor tendons, and each of the branches of this bifurcation is inserted on the *side of the phalanx*, and not as many anatomists have thought, on the front of the phalanx. It is these prolongations which, more extended than the aponeurosis, ought to be divided. When the skin and the aponeurosis are dissected, some difficulty is experienced in separating them, on account of the cellular tissue, and the fibrous prolongations which arise from the aponeurosis. These adhesions explain the puckering, and the movements of the skin. One might fear, in the section of the fibrous prolonga-

tions, the wounding of the vessels and nerves, but when the aponeurosis is stretched, it forms a kind of bridge which protects them, so that it can be cut without danger."

Two other successful cases are also reported in the same lecture, one occurring in a coachman, about forty years of age, in whom both hands were similarly affected, so that this could not be attributed to the use of the whip. In the other case, the contraction occurred in the left hand of a wine-merchant.

Goyrand's Operation.—M. G. Goyrand of Aix, operated upon these cases like Dupuytren, by open wound, but instead of making transverse incisions through the skin, and contracted fascial bands, as recommended by Dupuytren, he made longitudinal incisions over the fascial bands, or as he calls them, abnormal fibrous fasciculi, which he then divided transversely.

In the "Gazette Médicale,"* M. Goyrand observes:—"When this affection exists how can we cure it? No machines for extension will have any effect. Section of the bridles will alone allow extension of the fingers. . . . Dupuytren advised and performed the transverse section of the assumed small prolongations of the aponeurosis, and also of the skin that covered them.

"In the Memoir† which I addressed to the Academy, I advised the longitudinal incision of the

* "Gazette Médicale de Paris," 1835. Tome III., p. 485.

† "Mémoires de l'Académie Royale de Médecine," Tome III.; and "Gazette Médicale," 1834, p. 219.

skin over each bridle, previously stretched, then to separate the lips of these incisions and detach from them the fibrous cords, and cut across these cords thus isolated. If the pre-digital bridles send out prolongations to the first phalanges, before inserting themselves into the second, one should cut them above and below these prolongations. If the section of these fibrous cords leaves shreds in the wound, they should be excised. The fingers should be afterwards fixed in a position of complete extension, and the incisions reunited by the first intention."

Mr. J. F. South, in his translation of Chelius,* alludes to Goyrand's operation, and observes:—"Goyrand does not divide the skin transversely, as Dupuytren does, because in straightening the finger the cut in the skin gapes too much; but he cuts through it longitudinally, and through the bridge transversely."

Cæsar Hawkins' Operation.—Cæsar Hawkins, in the year 1835, published in the "Medical Gazette"† an account of a case of Dupuytren's contraction affecting the little and ring-fingers of the left hand, in a man æt. 30, admitted into St. George's Hospital.

Mr. Hawkins was satisfied that the fascia alone was the seat of the contraction, and fully recognised the accuracy and importance of Dupuytren's observa-

* "A System of Surgery," by J. M. Chelius. Translated by John F. South. Vol. II., p. 194. London: Renshaw. 1847.

† "Medical Gazette," Vol. XV., p. 814, March 7th, 1835; and also in "Contributions to Pathology and Surgery," by Cæsar H. Hawkins, F.R.S. Vol. II., p. 205. London, 1874.

tions which had been published in 1832, and to which he refers. In this case Mr. Hawkins successfully adopted Dupuytren's operation by open-wound, making one transverse incision in the palm for the division of the large fascial bands, and semi-circular incisions at the base of the little and ring fingers for the division of the digital prolongations of the fascia. The case did well, and the report states, "he has as much power over the fingers which were operated upon as any other."

In the year 1844, Mr. Cæsar Hawkins also published, in the "Medical Gazette," an account of another case of Dupuytren's contraction in both hands. "William Kisby, æt. 39, a coachman, was admitted on the 17th of April, with contraction, in a greater or less degree, of all the fingers of both hands, but chiefly of the fore, ring, and little fingers of the left hand, and of the ring, and little fingers of the right hand."

After alluding to Dupuytren's dissection, and his account of the pathology of this form of contraction, Mr. Hawkins observes:—"Dupuytren says that it takes place in those persons who are subjected to laborious employments in which some hard substance is constantly rubbed and pressed in the palms of their hands, and he instances coachmen, of whom our patient is one, as being one of the classes liable to it. I think, however, you will be able to find a *few*

* *Op. cit.*, *Medical Gazette*, Vol. XXXIV., p. 273, May 31st, 1844; also "Contributions to Pathology and Surgery," by Cæsar H. Hawkins, F.R.S. Vol. II., p. 202. London, 1874.

coachmen in London besides this man, and perhaps you will look in vain for another instance of this contraction among them. I have seen it, moreover, in several instances, in persons of a higher class of life, who have never, so far as I know, been subjected to the causes I have mentioned; so that I am not certain that the opinion of Duyuytren is correct; and I do not see very clearly why, if it were correct, the contraction should be confined, as it almost invariably is, to the ring and little fingers, nor why it should attack both hands, as in this case (which is not, indeed, a common circumstance;) for the two hands are very differently employed in his labours. This man had some little contraction of the fore finger also, but it has nearly gone since he has been in the hospital, and it is unusual."

It is especially worthy of remark in this case, that Mr. Hawkins was obliged to defer the operation in consequence of an attack of gout. Mr. Hawkins observes:—"I have not been able to perform the operation for our patient yet, for he was unfortunately attacked, a few days after admission with gouty inflammation, to which he is liable, in several joints successively, which has not yielded readily to medicine." This, probably, offers some better clue to the cause of the contraction than that afforded by his occupation.

Before proceeding to operate in this case, Mr. Hawkins carefully weighed, in his own mind, the supposed advantages of a subcutaneous operation for division of the fascia, which had suggested itself

to him and observes: *—"With regard to the mode of performing the operation, you are aware that for contraction of tendons, we generally endeavour, at the present time, to perform a subcutaneous incision, so that no air may enter the divided parts to interfere with union by the first intention; and the parts having united to a certain degree, extension is then made, to separate the ends while the united substance is still soft. Now I have turned over in my mind the propriety of acting thus in the present case, but I am inclined to think I shall not do so. You know that the great risk of wounds and injuries about the plantar and palmar fascia is from confinement of matter, which is then made to pass along the tendons of the muscles, and thus they form very troublesome cases. Now in order to remove the contraction in this case, it will be necessary to make several cuts; the band of fascia must be divided in the palm before its separation to the two fingers, each finger must probably have another incision opposite to the joint, with the metacarpal bone, and very likely similar cuts must be made at the sides of each finger. To do this below the skin, which is inseparably joined to the fascia, must be at least very difficult, and not without risk of the digital arteries and nerves being injured; and then, as the extension on a hand-splint must be considerable, I think it would be altogether impossible to escape suppuration in some of the several incisions. If the operation is done in this manner, and matter does

* *Op. cit.*, p. 203.

form, it is necessarily confined, and may do much harm. I think, then, I shall operate, as I have done before, by direct incisions through the skin and subjacent contracted portions of fascia. It is true, there will then be several suppurating wounds, a little lint being put between the edges of the incisions to prevent their union; but then, on the other hand, there will be no confinement of matter, and consequently no probability that the suppuration will extend itself beyond the small cuts themselves, which extension is much more dangerous than the open-wounds can be. It does not appear that Dupuytren met with any mischief when he did the operation in this way, and when I have done it myself, there was no inflammation of any importance produced."

It will thus be seen that this accomplished English surgeon in the year 1844 foreshadowed the subcutaneous operation which I have recommended for its relief, and accurately indicated the spot at which the fascial band, or bands, in the palm of the hand, and also the digital prolongations of the palmar fascia should be divided. The danger of deep suppuration, however, outweighed, in Mr. Hawkins' opinion, the supposed advantages of the subcutaneous operation. He followed Dupuytren, and preferred performing the operation by open-wound.

In explanation of this decision, it must be remembered that subcutaneous surgery was at this time in its infancy, and the law upon which the safety of subcutaneous operations depends was not fully recognised. Subcutaneous tenotomy, as improved and performed

by Stromeyer in 1831, was introduced into England in the year 1837, by Dr. Little, who had been operated upon by Stromeyer, in the previous year.

Busch's Operation.—Dr. Otto W. Madelung* has published an account of the treatment of cases of Dupuytren's finger contraction adopted in the Surgical Hospital at Bonn, by Professor Busch. This operation belongs to the class of open-wounds, and consists in dissecting up a triangular flap of skin from the contracted cord in the palm of the hand, and then dividing all the bands of the contracted fascia which can be reached; as the flap thus raised contracts, the lower points of the wound may be united by sutures:—"A light bandage closes the wound, the hand is then kept by the patient in a sling without the slightest attempt to preserve the extension.† . . . Extension movements with the finger are only made when the wound has entirely granulated, and then only in a light, gentle way. At first, wood cylinders of various sizes are laid in the hand; later the hand is stretched on a back splint. Active and passive movements are now to be made in, and during the time the hand-bath is used for cleansing of the wound. More complicated apparatus than the above are never required. The healing of the wound, accelerated, perhaps, by skin-grafting, is accom-

* "The Causes and Operative Treatment of Dupuytren's Finger Contraction," by Dr. Otto W. Madelung. No. 15 of the "*Berliner Klinische Wochenschrift*," for 1875. Translated from the German. London: Trübner & Co., 1876; and a review of Dr. Madelung's pamphlet will be found in the *Dublin Journal of Medical Science* for December, 1876, p. 486.

† *Op. cit.*, p. 11.

plished in three or four weeks." Successful cases under this treatment are referred to, but one is added by the author, in which, notwithstanding the use of Lister's antiseptic treatment, suppuration with sloughing of the flexor tendon of the little finger took place, this however is stated to have been the only unfavourable case.

Madelung, in referring to the number of cases from different countries which had fallen under his observation, and had resorted to Bonn for the sake of the opinion of Professor Busch, whose treatment he especially records, states "that almost all these individuals had sought surgical help, and carried out various methods of treatment, both mechanical and operative, all of which had failed;" and he further observes:—"The surgeons of all countries seem to be unanimous in their opinion of the inutility and danger of the operative treatment of the disease in question."

Post's Operation.—Professor Alfred C. Post,* of New York, also operates upon these cases by open-wound, making incisions at a number of points, but not larger than absolutely required, as he believes that the adhesion to the skin prevents a strictly subcutaneous section being made. He advocates immediate extension on a metal splint, the dressings to be removed every two or three days, and passive motion applied. Of the five cases cited by Professor Post,

* "On Contraction of Palmar Fascia, and of the Sheaths of the Flexor Tendons," by Alfred C. Post, M.D., of New York. *Archives of Clinical Surgery*, August, 1876.

in 1876, only one, No. 3, that of a lawyer, æt. 44, who suffered from contraction of the fingers in both hands, seems to have been of Dupuytren's contraction, the others depending on abscesses and traumatic inflammation.

During my visit to America in 1876, when I went as the representative of the Medical Society of London, to attend the International Medical Congress in Philadelphia, I had the opportunity of discussing this subject with Professor Post. He seemed to be strongly of opinion that it was impossible to divide the contracted cord in the palm of the hand by subcutaneous incisions, as adhesion to the skin prevented the knife being passed between the skin and the cord. I explained, however, that the close adhesion between the skin and the cord—even in very severe cases—never extends through the entire length of the cord, and that by flexing the hand at the time of operation, it was possible to introduce the small fascia knife under the skin, and pass it between the skin and the cord, generally at the two extremities of the latter, where the skin was not adherent to the cord. This allows of an immediate gain by extension; and that portion of the cord at which close adhesions of the skin exist being thus isolated and freed from tension, undergoes a gradual process of atrophy and absorption, just as all the knotty cutaneous thickenings do, after the subcutaneous division of the fascial bands.

Sir William Fergusson's Operation.—The late Sir W. Fergusson alludes to the operation by open-wound as likely to obviate the disposition to re-contraction,

and observes: *—"Indeed, so much is this the case, that if the offending part were very superficial, I should be inclined to dissect a portion of it out at once.

"In many cases, I believe, this last named practice should be resorted to at first. An incision should be made lengthwise through the skin over the whole of the contraction, and if the integument be tolerably soft and thick, it should be turned off on each side, so as to expose the fibrous tissue, which should then be carefully taken away. To effect this satisfactorily, it is sometimes advisable to make one or more cross incisions in the skin, for this tissue, having been long contracted, does not stretch so readily as in a healthy state. In any, or all of these operations, the utmost care should be taken to avoid the nerves and blood-vessels at each side of the finger, and if the stretching can be satisfactorily effected without opening a sheath or touching a tendon, so much the better, as then some movement might be expected afterwards; but if the tendons require division, the finger must remain stiff, and, in anticipation of such an event, it will be well to consider what good can be expected from the proposed operation."

My former colleague, the late Mr. John Gay, told me that he had successfully adopted the plan above recommended by Sir William Fergusson, of dissecting out the contracted fascial band. In one case, in the year 1878, I had the opportunity of seeing him perform this operation in a gentleman whose little finger of the left hand was much contracted. An incision

* *Op. cit.*, p. 260.

was made through the length of the contraction, and the fascial band was carefully dissected out. Suppurative inflammation followed the operation, and the articulation became involved. Ultimately, however, the case did well, but the joint remained permanently stiff.

Operations by open-wound condemned.—All operations by open-wound, for these cases should be condemned as unnecessarily severe—involving a long, and tedious reparative process, with the risk of suppurative inflammation, and also a liability to failure, in which event the condition of the patient would be worse than before the operation, contraction from cicatrix being one of the most difficult conditions to relieve.

In illustration of this I would refer to the case represented in Plate 2, Fig. 3. Dr. C., a physician practising obstetric medicine, and formerly a colleague of my own. The little finger of the right hand had for some years been increasing in contraction, and he submitted to an operation by open-wound, the contracted fascia being, I believe, dissected out rather than simply divided. The operation failed, and the contraction returned in an aggravated form, as shown in the wood-cut.

I operated upon the finger by subcutaneous division, and gradual mechanical extension in the year 1863. Considerable improvement followed, but in consequence of the cicatricial contraction resulting from the previous operation, it was impossible to bring the finger into a perfectly straight position.

Nevertheless, in England the operation by open-wound has long been practised by the majority of surgeons, and is still recommended in some of the text-books.

General Distrust in Operations.—There is still in England a general distrust in all operative procedures for the treatment of this affection, which is regarded by many surgeons as incurable; and in consequence of the supposed necessity for the division of tendons, in which some believe still, the patients are frequently advised to bear the ills they have, rather than run any risk from suppurative inflammation, with the doubtful gain of a stiff and useless finger.

SUBCUTANEOUS OPERATIONS.

Subcutaneous operations for contracted fingers have been performed by many surgeons in this and other countries, and it is interesting to trace the history of these operations, and note the changes of opinion that have taken place with respect to the relative merits of the plan of operating by open-wound, or the subcutaneous method; the more recent changes being in favour of a return to the method of operating by open-wound.

The earliest mention of a subcutaneous operation, or an approach to a true subcutaneous operation, as understood at the present time, for finger contraction, will be found in the works of Sir Astley Cooper, written long before the observations of Dupuytren describing the pathology of this affection, and before the introduction of subcutaneous tenotomy by Stromeyer.

Sir Astley Cooper's Subcutaneous Operation.—Sir A. Cooper in his “Treatise on Dislocations and Fractures,”* published in 1822, makes the following brief but important allusion to the affection we are now describing as Dupuytren’s contraction of the fingers. In the chapter on “Dislocations of the Fingers and Toes,” after describing a partial dislocation or displacement of the toes produced by contraction of the flexor tendons, causing the contraction we now describe as “the hammer toe,” for which he recommends amputation as the only means of relief, Sir A. Cooper proceeds to observe at page 524:—“The fingers are sometimes contracted in a similar manner by a chronic inflammation of the thecæ, and aponeurosis of the palm of the hand, from excessive action of the hand, in the use of the hammer, the oar, ploughing, &c. When the thecæ are contracted, nothing should be attempted for the patient’s relief, as no operation or other means will succeed; but when the aponeurosis is the cause of the contraction, and the contracted band is narrow, it may with advantage be divided by a pointed bistoury, introduced through a very small wound in the integument. The finger is then extended, and a splint is applied to preserve it in the straight position.”

It is very remarkable to find that this great English surgeon not only recognised the importance

* “A Treatise on Dislocations and Fractures of the Joints,” by Sir Astley Cooper, Bart., F.R.S. First Edition, p. 524. London, 1822. Precisely the same paragraph also occurs in the Fifth Edition, p. 487. London, 1826; and it is again repeated without alteration in the edition enlarged and edited by B. B. Cooper in the year 1842.

of contraction of the palmar fascia—apart from contraction of the tendons, or chronic inflammation of the thecæ—as a cause of finger contraction in some cases; but that he also recommended a subcutaneous operation for the division of the contracted band of fascia, and adopted the plan of immediate extension of the finger after the operation.

Although Sir A. Cooper's operation, according to the description given, was not performed strictly in accordance with the principles of subcutaneous surgery, as now understood; nor with all the precautions to exclude the admission of air, adopted at the present time, still it seems to be the nearest approach to a true subcutaneous operation, and there can be no doubt that in a great degree Sir A. Cooper foreshadowed the operation and after-treatment, which it is my object to advocate in the present paper.

Jules Guérin's Subcutaneous Operation.—There may be at the present time some difficulty in ascertaining to whom the credit belongs of having first performed the true subcutaneous operation for finger contraction; but my friend, the late Dr. Henry Dick, whose intimate acquaintance with the foreign literature of subcutaneous surgery rendered him an authority upon the subject, stated that the first account of the subcutaneous operation for contracted fingers is to be found in the writings of M. Jules Guérin, about the year 1840, or perhaps earlier than this, and he was probably the first to perform this operation.

To M. Jules Guérin we are chiefly indebted for the advancement of subcutaneous surgery, after

Stromeyer had reintroduced and improved subcutaneous tenotomy in the year 1831—an operation which had been allowed to remain dormant since it was first performed by Delpech in the year 1816, and the rules for the after-treatment, almost identical with those adopted at the present time, had been laid down by him.

Subcutaneous tenotomy was undoubtedly the starting point from which subcutaneous surgery has gradually been developed, including as it does at the present time a large number of operations which owe their immunity from inflammation, and absolute freedom from danger, to the fact of their being performed in such a manner as effectually to exclude the admission of air.

Although the law upon which subcutaneous surgery is based had been first pointed out by Hunter* in 1794, when he described the difference in the healing of wounds, and made the exposure or non-exposure to air the basis of his classification of injuries; still for the practical application of this law, and the extension of subcutaneous surgery we are mainly indebted to M. Jules Guérin, who must be regarded as the chief exponent of the subcutaneous law† in its physiological and pathological bearings. In the year 1841 he more especially directed attention to the difference between the reparative process in subcutaneous and in open-wounds; and in the absence

* "Treatise on the Blood, Inflammation, and Gun-shot Wounds," by John Hunter. London, 1794.

† "Essais sur la Méthode sous-cutanée," par M. Jules Guérin, Paris, 1841.

of inflammatory products in the subcutaneous class, discerned the greater perfection of the reparative process leading to the immediate union of divided structures by the organisation of effused blastematous material. These observations have since been confirmed by Sir James Paget,* who added, from microscopical observations, a description of the structural changes which occur in the development of the reparative material in the two great classes of wounds, viz.: the open-wounds exposed to the influence of the air, and the subcutaneous wounds from which the air is excluded.

In the discussions which took place in the Académie de Médecine† in Paris, in the years 1842 and 1843, in which M. Jules Guérin, Bouvier, Malgaigne,‡ Velpeau, and others took part, it does not appear that the opinion of Dupuytren, that the palmar fascia alone was the cause of the finger contraction, was generally admitted. M. Jules Guérin speaks of the necessity of dividing the flexor tendons, and states that he not only obtained perfect union of the divided extremities without adhesions, but that the movement in the fingers was well preserved. Although the precise date must be uncertain, there can be no doubt that M. Guérin operated subcu-

* "Lectures on Surgical Pathology," Vol. I., p. 170. London, 1853.

† "Bulletin de l'Académie Royale de Médecine." Tome VIII. 1842-1843. "Discussion sur la Ténatomie des Fléchisseurs de la Main et des Doigts," pp. 129, 154, 230, 253, 341 to 559.

‡ See also observations by Malgaigne on the various forms of finger contraction, "Déviation des Doigts;" Première Leçon et Deuxième Leçon in his "Leçons d'Orthopédie," by J. F. Malgaigne. Paris, 1862.

taneously for the relief of Dupuytren's finger-contraction.

Sir William Fergusson's Subcutaneous Operation.—The late Sir W. Fergusson recommended the subcutaneous operation in some cases, and in the last edition of his "Practical Surgery,"* refers to it in the following terms:—"Such cases may be treated with subcutaneous division of the rigid textures, and when extension alone will not suffice, it is a method which, in many instances, I consider preferable to any other. A narrow knife should be pushed under the skin in front of the contraction, and then carried through the most prominent band, whether this be merely the aponeurosis, condensed cellular tissue, or tendons, and thereafter the fingers should be gradually extended in a splint by means of bandages."

Dr. Little's Opinion.—In the "System of Surgery,"† edited by T. Holmes, the writer of the article on "Orthopædic Surgery," Dr. Little, describes Dupuytren's contraction of the fingers, and considers that the flexor tendons are implicated in the contraction, and require division. He recommends a subcutaneous operation, and observes:—"In rigid unyielding cases of long duration, tenotomy is remarkably efficacious A puncture half a line in width suffices for the passage of a firm tenotome beneath the tendon in the palm. The tendon is thus divided from below upwards considerable yielding of the contracted

* *Op. cit.*, p. 259.

† "A System of Surgery." Edited by T. Holmes. Second Edition. Vol. III., p. 698. London: Longman & Co., 1870.

finger, the tendon of which has been severed, is at once perceived. Manipulations and mechanical treatment complete the cure. We have frequently thus effected entire restoration of the hand and fingers This operation is a valuable illustration of the success of subcutaneous tenotomy compared with Dupuytren's painful operation, even when performed by so able a surgeon as the late Sir A. Cooper. We have had under observation two cases in which, by means of a large crucial incision in the palm, the indurated fascia had been dissected out and removed. The operation had no better result than that of causing a large contracted cicatrix, more rigid than the former state of things, and quite irremediable."

Erichsen's Opinion.—In the last edition of Professor Erichsen's work on "The Science and Art of Surgery," the essential dependence of the form of finger-contraction we are now describing, upon thickening and contraction of the palmar fascia and its digital prolongations is fully recognised; and this is attributed partly to local, and partly to constitutional causes such as a rheumatic, or gouty diathesis. The subcutaneous division of these structures is recommended, and when this fails, the author advises that the operation by open-wound should be had recourse to. Professor Erichsen observes.* "*The treatment of digital contractions is purely operative. The kind of operation must be determined by the pathological cause of the disease. If the contraction be*

* "The Science and Art of Surgery," by John Eric Erichsen. Seventh Edition, Vol. II., p. 363. London; Longman & Co., 1877.

tendinous, then subcutaneous tenotomy must be done. If, as far more commonly is the case, it be fascial, then the tendon and its sheath must not be touched, but the contracted structures outside them must be cut across. This consists, when the deformity is slight and recent, in dividing each tense digital fascial prolongation by a subcutaneous incision. This should be done opposite the second phalanx where it is usually most tense ; but if the other finger-joints be affected, a separate section may be required opposite each phalanx. Should it be found impossible to straighten the fingers with such limited incisions, or should the skin be firmly adherent to the subjacent fibrous band, a long crucial incision may be made through the skin, the flaps dissected back, the fascial bands divided, or dissected off the sheaths of the tendons, and the fingers straightened. As the flexor tendons are not primarily affected, they need not be divided. After the operation, the hand should be placed on a digitated splint, and the fingers kept extended."

Gant's Opinion.—In the second edition of Mr. Gant's "Science and Practice of Surgery,"* the influence of the palmar fascia in the production of the contraction is also recognised, and its subcutaneous division recommended. But tenotomy is also recommended in some instances, and a case in which the author states that he successfully divided the tendons, in a clergyman, aged seventy-nine, in whom both hands were similarly affected, is adduced in illustra-

* "The Science and Practice of Surgery," by F. J. Gant. Second Edition, Vol. I., p. 833. London ; Bailliere, Tindall & Cox, 1878.

tion. The operation, by open-wound, in which the skin is dissected back, and the fascial bands divided, or dissected out, is also described.

Bryant's Opinion.—In the third edition of Mr. Bryant's "Practice of Surgery,"* although the author considers that the flexor tendons, as well as the palmar fascia, produce the contraction, the subcutaneous operation with the modifications in its performance, and the after-treatment which I have adopted is recommended, and the directions for its performance, which I published in the *British Medical Journal* of June 29th, 1878, are given at length. Mr. Bryant also refers to the operation by open-wound of Professor Busch, of Bonn, described by Madelung, to which I have already adverted, and observes, "I have adopted this practice in several cases with excellent results."

Druitt's Opinion.—In the eleventh edition of Druitt's "Surgeon's Vade Mecum,"† Dupuytren's finger-contraction is described as depending essentially upon "shortening and rigidity of the palmar aponeurosis," and this is illustrated by a woodcut taken from Mr. Partridge's dissection in King's College Museum (the same as represented in Figs. 1 and 2). The idea of its dependence upon contraction of the flexor tendons, or adhesions to the sheath of the tendons is strongly opposed by the author, who

* "A Manual for the Practice of Surgery," by Thomas Bryant. Third Edition, Vol. II., p. 323. London: Churchill, 1879.

† "The Surgeon's Vade Mecum," by Robert Druitt. Eleventh Edition, p. 696. London: Henry Renshaw, and J. and A. Churchill, 1878.

in reference to its cause, observes : " This affection is not caused by any particular occupation, but is part of the morbid changes accompanying *chronic rheumatic arthritis, or rheumatic gout*, and is a malady of the comfortable classes." As to the treatment, Dr. Druitt relies entirely upon the subcutaneous division of the contracted bands of the palmar fascia, and its digital prolongations, followed by immediate extension, as recommended by myself, and the directions for its performance, together with the after-treatment which I have given, are quoted at length.

OPERATION AND AFTER-TREATMENT ADOPTED BY THE AUTHOR.

I have never practised any other than the subcutaneous operation for contracted fingers; but have materially modified the details, both with regard to the mode of performing the operation and the after-treatment. The success has been found greater, and the treatment much less irksome to the patient, as well as of shorter duration than the method of operating, and the after-treatment which I adopted in the earlier part of my practice, from the teaching of my late colleagues and predecessors at the Orthopædic Hospital, Mr. Tamplin and Mr. Lonsdale. They believed that both fascia and tendon were involved in the contraction, and divided the contracted cords in the palm of the hand in the same way as they divided tendons, subcutaneously cutting from below upwards, and making only one puncture.* They also adopted

* " On the Nature and Treatment of Deformities," by R. W. Tamplin, p. 262. London : Longman & Co., 1846.

FIG. 5.

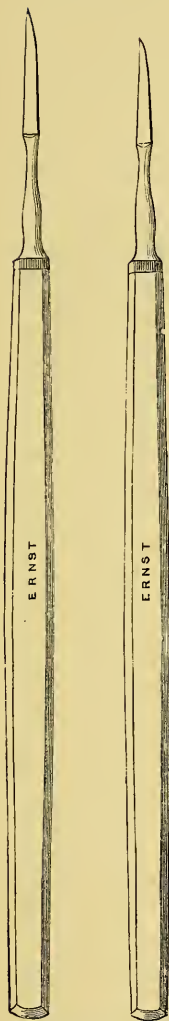


Fig. 5.—Small Knives with straight cutting edge, used for division of bands of fascia.

the same method of after-treatment, by gradual mechanical extension, using steel instruments, with rack-and-pinion movements opposite the joints of the fingers, like that represented in Fig. 10.

Further study of these cases, and the opportunity which was accidentally afforded me, in the year 1864, of seeing that the tendons were not involved in a severe case of finger-contraction previously referred to, in which the palm of the hand was torn across by a horse, confirmed me in the belief that the tendons were not implicated in this form of contraction of the fingers, and that surgically, we had to deal with contraction of the palmar fascia alone, as Dupuytren had described the affection.

I therefore commenced the practice of making *multiple subcutaneous divisions of the fascia and its digital prolongations*, introducing the fascia knife with a straight cutting edge terminating in a point, as shown in Fig. 5, and carrying it between the skin and the contracted cord, which I then divide by cutting downwards very slowly and cautiously, taking care not to dip the point or divide any structures, except the contracted band of fascia. The central pointed tenotome generally used does not divide the fascial bands so

readily or with the same precision; and the smaller bands, or digital prolongations, are apt to slip off the point of the ordinary tenotome.

When there is a tense cord extending from the contracted finger to the palm of the hand, I make the *first puncture* in the palm of the hand, a little above the transverse crease and where the skin is not adherent to the fascia, or tightly stretched over the contracted cord, so that the fascia knife can be readily introduced between the two.

The *second puncture* should divide the same cord as the first, between the transverse crease and the web of the fingers, thus leaving the contracted band in the palm of the hand, where adherent to the skin, isolated, and cut off from its connexions at its upper and lower extremities.

The *third and fourth* punctures divide the lateral bands, or the digital prolongations of the palmar fascia, which pass from the central cord in the palm to the adjacent sides of the fingers. These must be divided very carefully, in order to avoid cutting the vessels and nerves along the sides of the fingers. The punctures should be made one on each side of the contracted fingers at the bifurcation of the cutaneous web between the fingers, and the incisions directed obliquely towards the palm of the hand. These incisions will divide the strongest and most prominent bands which produce the flexion of the first phalanx of the finger upon the hand, and if care be taken to avoid dipping the point of the knife, there will be no fear of wounding vessels or nerves.

Sometimes lateral bands of contracted fascia require to be divided near to the centre of the first phalanx; and this must be done by puncture, either near to the dorsal aspect of the finger, which I prefer, or if it cannot be reached from this point, the puncture must be made on the anterior aspect of the finger near to the edge of the contracted band, the knife being directed in either case transversely towards the bone; but this cut must be made very carefully to avoid the artery and nerve, the surgeon remembering that the band, though tough and strong, is at the same time very thin.

Frequently a lateral band may have to be divided between the first and second phalanges, or one on either side near to the articulation, and this must be done carefully; the band being divided above and below the joint with the precautions just described.

Occasionally it will be necessary to perform a similar operation for contraction of the third phalanx, which, however, is but rarely drawn down, but in several instances I have had to operate for contraction of the third phalanx.

I always avoid making any central incisions in front of either the first or second phalanx, as the sheath of the tendons, or the tendons themselves, may be readily injured by such incisions, and would lead to a loss of power of flexing the finger after the operation.

As the fascia-knife is being withdrawn from each puncture, the surgeon should make pressure with the forefinger of his left hand on the spot at which the

fascia has been divided, and the subcutaneous track through which the knife has passed. A pledget of lint or small adhesive compress should be immediately applied over each puncture and retained in position by a strip of plaster. Lint soaked with blood becomes so hard that on third or fourth day it will sometimes, when the hand is thin, cause a small slough if the pressure be continued; I therefore now generally use small compresses made either of porous india rubber, German tinder or felt, spread with adhesive plaster. By this means hæmorrhage under the skin is arrested, and the true subcutaneous character of the operation preserved. After the requisite number of punctures have been made and thus protected, an additional compress of lint should be applied, and the hand bandaged with the fingers in an extended position—if they can readily be brought so—to a softly padded metal splint as shown in Fig. 6. The number of punctures required must vary with the severity of the case, and when the contraction is limited to two fingers—say the ring and little fingers which are most frequently contracted—six or eight punctures may be sufficient; but in severe cases, when all four fingers and the thumb are contracted, similar to that shown in Plate 6, Fig. 1. I have found it necessary to make as many as twenty-three punctures.

In some of these cases it may be desirable to divide the operation into two stages, leaving probably the thumb and index finger to be operated upon after the three outer fingers have been straightened. It is not, however, always possible to do this, in conse-

quence of the number of connecting bands, and then in such a case I prefer to complete the operation at one sitting.

In the year 1864 I also adopted another important modification in the treatment of these cases, viz.:—The plan of *immediate extension*, bringing the finger,

FIG. 6.

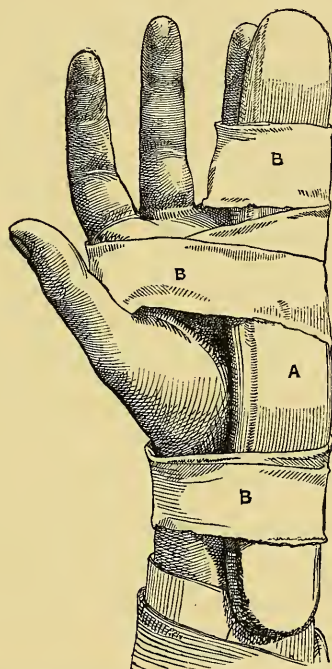


Fig. 6.—A, Retentive metal splint, softly padded, to which fingers and hand are bandaged B, immediately after operation.

or fingers, as nearly as possible into the fully extended position, at the time of the operation; and afterwards applying, as a retentive apparatus, a well padded metal splint, bent to the shape of the wrist, hand, and fingers, and applied along the palmar surface.

The finger, or fingers, as well as the hand and wrist, are then bandaged to the splint, as shown in Fig. 6. This was a great change from the prolonged after-treatment required by the method of gradual mechanical extension, made with the complicated steel instrument regulated by rack-and-pinion movements, which we formerly used in all cases.

I was led to make this alteration from the *gradual* to the *immediate* mechanical extension after considering the pathological conditions and the objects to be accomplished with regard to the reparative process in fascia, as distinguished from the reparative process in tendons. *The object of immediate extension* is to widen as quickly as possible the gaps made by the incisions in the fascia, with the view of preventing union of the divided fascia, or to have the union as feeble as possible; objects precisely the reverse of those we desire to obtain after the subcutaneous division of tendons.*

Cases in which immediate extension cannot be carried out.—In some cases, it will be found impossible to carry out this method of immediate extension to the full extent required, more especially in those cases in which the second phalanx is sharply flexed upon the first, and the contraction has existed for several years. This arises from two causes: *First*, The difficulty of dividing all the contracted fascial bands in the neighbourhood of the phalangeal joints, without

* "On the Reparative Process in Human Tendons after Subcutaneous Division for the Cure of Deformities," by William Adams. London: J. Churchill, 1860.

risk to vessels and nerves, the tendons, or even the joint. *Secondly.* The risk of tearing the skin if immediate and complete extension should be attempted by any forcible manipulation. In the case represented in Plate 4, Fig. 1, in which the second phalanx of the little finger was flexed upon the first at a right angle, immediate extension could not be made to much more than half the extent required to bring the phalanges in a straight line with each other. The contraction of the first phalanx was immediately, and almost completely relieved by the division of the contracted fascial cord in the palm of the hand, and this, indeed, is the general rule; but the digital contraction remaining rendered it necessary to resort to the method of gradual mechanical extension, which I commenced on the fourth day with the instrument represented in Fig. 12. It took four weeks before the phalangeal contraction could be completely overcome, and all the phalanges brought into a perfectly straight line with the metacarpal bone, as shown in Plate 4, Fig. 2, and even during this rate of extension, the skin on the palmar aspect of the finger became so thin, shiny, and attenuated, that the extension had to be intermitted to some extent.

In some very severe cases also, of palmar fascia contraction in which the three outer fingers are involved, and have been drawn down into the palm of the hand for many years, immediate extension cannot always be made to the full extent required; generally, in these cases, about two-thirds of the full amount

of extension may be immediately obtained by division of the contracted fascial bands in the palm of the hand.

In both these classes of cases, therefore, it will be found necessary to resort to the method of gradual mechanical extension, but this may be carried out as rapidly as it can be borne by the patient.

AFTER-TREATMENT.

The first dressing of lint or adhesive compress and plaster should be allowed to remain undisturbed until the third or fourth day, by which time the cutaneous punctures will be found to have healed. The padded metal splint must also be worn continuously day and night for three or four days, but may be removed and re-adjusted at any time, even on the day of operation, either to relieve the pain sometimes caused by extension, or to diminish the pressure made by the extra lint-compress which is applied after the operation under the metal splint, to prevent hæmorrhage extending under the skin. I always take off the metal splint the day after the operation, and re-apply it with a lighter bandage; and at the same time I remove the extra pressure pad, and cut some of the plaster binding down the small pledgets of lint, or other material applied over the wounds, to release all pressure. In readjusting the splint the fingers are put up in an improved position, with the splint somewhat straightened, but without any forcible extension.

The after-treatment beyond the third or fourth

day will vary much according to the possibility, or otherwise, of carrying out the immediate extension principle. *When this method succeeds*, as I find it does in nearly every case in which the first phalanx is flexed towards the palm of the hand, by contraction of one of the four primary divisions of the

FIG. 7.

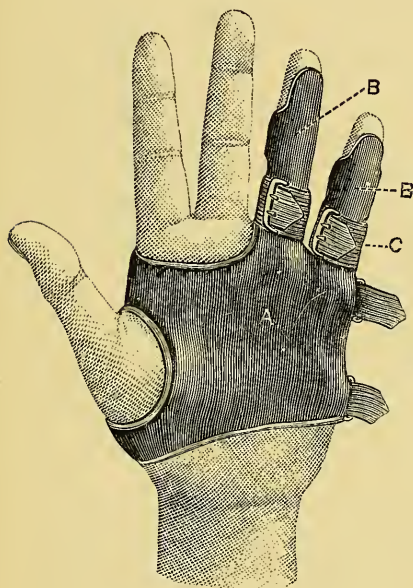


FIG. 8.

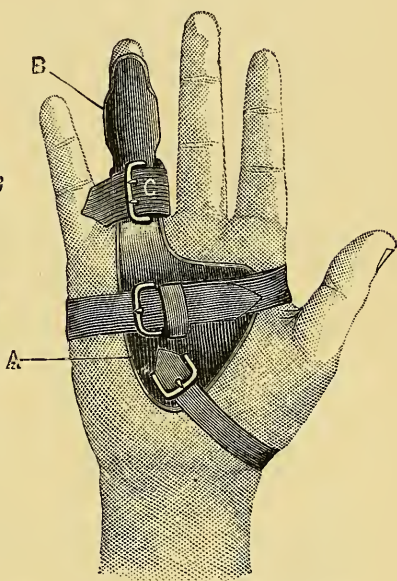


Fig. 7.—Retentive metal splint applied to the palm of the hand, with phalangeal extension for two, or if necessary three fingers, *A*, large palmar plate. *B B*, Phalangeal extension with trough to prevent any lateral displacement of the finger, *C*, strap and buckle passing over the first phalanx, with a thick dorsal pad attached.

Fig. 8.—A lighter form of retentive splint than shown in Fig. 7, to be used when the ring finger only is contracted. This is called the pistol-handle splint. The letters correspond to those used in Fig. 7.

palmar fascia and its digital prolongations, without the second phalanx being contracted, some form of retentive metal splint is all that will be required, and I generally use one of those represented in Figs. 7, 8, 9 and 10, applied on the palmar aspect of the hand

and fingers. This should be applied on the third or fourth day after the operation, the lint and plaster being removed.

The retentive metal splints represented in the former edition have been long discontinued, and

FIG. 9.

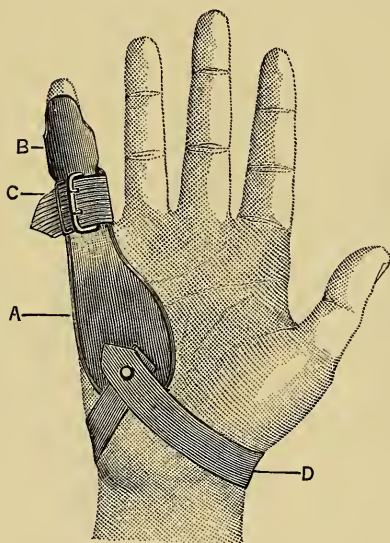


FIG. 10.

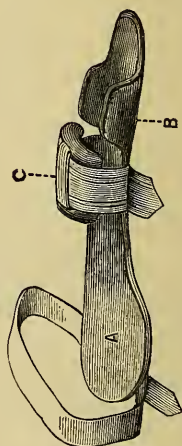


Fig. 9.—Retentive metal splint to be used when the little finger alone is contracted. *A*, elongated metacarpal Plate, held in position by strap *D*, passing over wrist. *B*, phalangeal extension with lateral trough. This like the other phalangeal extensions, should have a sharp bayonet bend from the metacarpal Plate. *C*, strap and buckle passing over the first phalanx with a thick dorsal pad attached.

Fig. 10.—Retentive metal splint for the little finger. The letters correspond to those used in Fig. 9, showing the splint as applied to the little finger. The thick dorsal pad is well shown in this illustration, as well as the trough formed by lateral wings, corresponding to the second phalanx.

new ones substituted, of a much lighter and more convenient form, as represented in Figs. 7, 8, 9, and 10.

The dorsal splint has been abandoned, and a smaller palmar splint substituted, varying in shape according to the fingers involved. In these splints

the digital prolongations are all bent at an angle from the palmar plates, somewhat in a bayonet-like shape, so as to extend the phalanges bodily and avoid any pressure at the extremities. The spirally twisted strap has been abandoned, and the finger or fingers, retained in position by a trough-shaped addition corresponding to the second phalanx, as shown in Fig. 10, whilst extension is maintained by a strap and buckle passing round the first phalanx, and a thick dorsal pad placed over the first phalanx, by which lateral constriction is avoided.

Another form of retentive metal splint is that represented in Fig. 11, consisting of a flat metal band passing along the dorsal aspect of the hand and finger, fastened round the wrist, and having a small leather cap at the end, made to receive the tip of the finger. For the pattern of this splint, I am indebted to my friend Dr. Guinness Beatty of Dublin, whose uncle—Dr. Beatty, the celebrated Obstetric physician—suffered from finger contraction, and wore this form of splint at night. By this means, together with the habit of extending the finger during the day, he prevented the increase of the contraction to any formidable extent, notwithstanding the hereditary character of the contraction in his family. This form of splint may be made of whalebone instead of steel, which was done by a medical man, my friend Mr. R., whose case is represented in Plate 1, Fig. 3. He continued to wear it at night only, for many months after the operation, and it was found to be thoroughly efficient as a retentive apparatus.

The retentive metal splint may be taken off every two or three days for the purpose of washing, but with these interruptions it should be worn continuously for three weeks. The finger, or fingers, will appear to be perfectly straight at the end of the first

FIG. 11

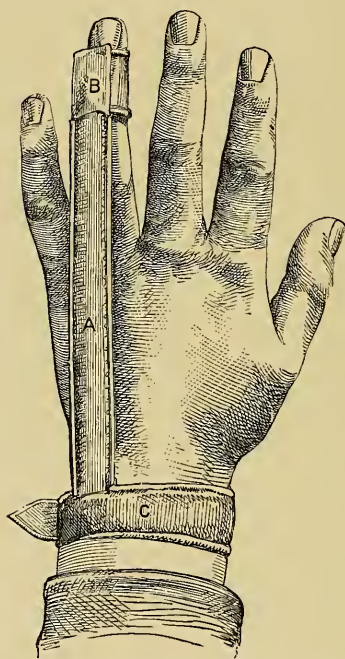


Fig. 11.—*A*, Another simple form of retentive metal splint, applied on dorsal aspect of hand and finger, the tip of which is received into leather ring *B*, fastened round the wrist *C*. Useful in some cases, and easily applied at night.

week, when the immediate extension principle is successful, but unless the extension be maintained during the reparative process so as to keep the divided extremities of the fascia as far apart as possible, they might re-unite, and the finger again become drawn down. After three weeks, the extension may

be gradually discontinued during the day time, and motion encouraged, but the retentive metal splint should be worn at night for some months longer.

The nodulated thickenings of the skin disappear spontaneously, and often with great rapidity, but I usually recommend gentle friction with oil, or iodine ointment, which softens the skin.

When it is found impossible to carry out the immediate extension principle to the full extent required, which may occur in cases of great severity,—more especially in those in which the contraction has commenced in the phalanges as already described, and the second phalanx is sharply flexed upon the first,—it will be found necessary to resort to the method of gradual mechanical extension, in a modified form, *i.e.*, the extension must be made as rapidly as it can be borne by the patient, great care being taken, to avoid abrasions from excessive pressure, or swelling of the finger or joint, from constriction by the bandage. The skin in the concavity of the contraction must also be carefully watched, as in some cases of long standing, it becomes rapidly thinned, shining and attenuated under a too rapid extension.

The idea is still that of rapid extension, but it must be carried out with these precautions. The instrument best adapted for this purpose is that represented in Fig. 12; the extension can be carefully regulated by a rack-and-pinion movement placed opposite each articulation, so that either the surgeon, or the patient, can regulate the degree of tension at pleasure, and avoid any undue pressure. It should

be applied on the fourth day, and worn continuously for several weeks, according to the severity of the case. As a general rule, it is advisable to keep up the continuous extension for a fortnight after the finger has been completely straightened; it may, however, be removed night and morning for the purpose of washing, gentle friction with oil may then be employed, and a little movement allowed. The

FIG. 12.

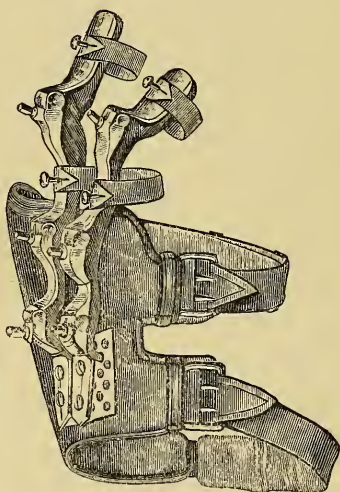


Fig. 12.—Extension instrument with rack-and-pinion movement for ring and little fingers applied on dorsal aspect of the hand and little fingers.

patient is delighted to find he has the full power of flexion and extension, proving conclusively that no tendon has been divided, but I do not encourage active muscular movements until after the third week from the operation; the reparative process at the seat of division requires this period of quiescence.

When the instrument with rack-and-pinion move-

ments is discontinued in the day-time and the finger has become straightened by its use, it is advisable for the patient to continue to wear at night, for about six months, one of the light and simple retentive metal splints represented in Figs. 7, 8, and 9. Although the after-treatment may be a little prolonged when it is necessary to make the extension by the instrument with rack-and-pinion movements, the ultimate result is equally good.

Anæsthetics.—With regard to the employment of anæsthetics in these operations, which must necessarily be done slowly and very carefully—numerous punctures often being made—I have always advised the use of chloroform or ether. I abandoned the use of ether spray, after employing it some years ago, because it was found to harden the skin, so as to make the puncture difficult, and obscure the anatomical relations of the parts. It occurred to me, however, that if I rapidly thawed the frozen skin by rubbing it with my hand, the deep anæsthesia would probably remain long enough for a subcutaneous operation, and this I have found to occur. In the case of a medical friend, Mr. R., upon whom I operated for contracted fingers, 17th of January, 1877, and who objected to take either chloroform or ether from the condition of his circulation, I made four punctures during the employment of the ether spray, and he only felt one of them, and that very slightly.

The hand of the gentleman alluded to, Mr. R., is represented in Plate 1, Fig. 3, showing severe contraction of the middle and ring fingers of the right

hand, previous to operation ; and its improved condition is now (1891) thirteen years after the operation quite as perfect as shown in Plate 1, Fig. 4. The fingers are perfectly straight and useful, without any loss of voluntary power. I need hardly say that, as a medical man, the contraction of the middle and ring-fingers had, in this case, been found seriously to interfere with his professional duties, and the complete restoration of the hand to usefulness affords good testimony to the value of the subcutaneous method of operating. The objection of hardening the skin, therefore, being done away with, the local anæsthesia, by the ether spray, is now found to be applicable to tenotomy, and some other subcutaneous operations, as its inventor, Dr. Richardson, originally thought it would be.

The operation and after-treatment which I now practise may be described as follows :—

1. The subcutaneous division of all the contracted bands of fascia which can be felt; the bands to be divided by as many punctures as may be necessary with the smallest fascia knife, represented in Fig. 5, passed between the skin and the contracted bands, which are to be divided from without inwards. A pledget of lint or adhesive compress being at once placed over each puncture, and retained in position by a strip of plaster, over which an extra pressure pad is placed, and the fingers and hand bandaged to a metal splint.

2. Immediate extension to the full extent required for the complete straightening of the fingers, where

this is possible, and the application of a retentive well padded metal splint, from the wrist along the palm of the hand; the fingers and hand to be bandaged to the splint. When the extension cannot be immediately made to the full extent, as in those cases in which the second phalanx is sharply flexed upon the first, it must be carried as far as possible, without producing pain or incurring the risk of tearing the skin.

3. On the day after the operation the bandage and splint to be removed, as well as the extra pressure pad, and the plaster binding down the small pledgets of lint to be cut to relieve pressure. The metal splint to be re-applied and so left until the third or fourth day; but the splint to be a little straightened, with the fingers in an improved position, but without forcible extension.

4. On the third or fourth day the splint and bandage to be removed, as well as the plaster and lint compresses over the cutaneous punctures, which are always found to be healed by that time. A piece of adhesive plaster, as a protective, and to promote absorption of the cutaneous thickening should be applied, and the fingers and hand to be lightly bandaged. The form of apparatus now to be used must vary according to the case, and whether it will or will not yield to the immediate extension principle. If it should do so, a simple metal retentive splint will only be required to be worn either on the palmar or dorsal aspect of the hand. If from the severity of the phalangeal contraction it is necessary to resort to

the gradual extension principle, then the instrument described with rack and pinion movements should be applied, and the extension carried out as rapidly as it can be borne without pain, or any undue pressure.

5. Whichever plan may be adopted, and whether the simple retentive splint, or steel instrument with rack and pinion movements be employed, the extension must be kept up continuously night and day for three weeks, the splint and bandage being removed every two or three days. After three weeks the extension may be gradually discontinued during the daytime and motion encouraged, but some form of retentive splint must be worn at night for some months longer, according to the severity of the case.

Relapse of the Contraction I believe is now, to a great extent, guarded against by the plan of dividing subcutaneously all the contracted bands of fascia by as many punctures as may be necessary; and also by the adoption of the method of immediate extension.

We have thus the protective influence of the subcutaneous method against the formation of such inflammatory adhesions as would result from an open wound, and form the greatest obstacles to the restoration of motion; and the separation of the divided extremities of the fascia by immediate extension renders their re-union impossible. Relapse can therefore only occur from adjacent bands and fibrous structures becoming invaded by chronic inflammatory thickening, due to the persistence of the original constitutional disposition to this affection, and this will occasionally occur. We have, moreover, by the

method of subcutaneous puncture, instead of an open wound with dissection of the contracted band, an absolute guarantee against the only incurable form of re-contraction, viz., that caused by cicatricial contraction.

If relapse should occur, the operation can be repeated with every prospect of success, and in the cases in which I have repeated the operation the result has been quite as satisfactory as at the time of the first operation. In two cases only I have operated a third time, and in both cases the fingers were easily restored to the straight position, without their power of flexion being in any way impaired.

The last case was one associated with a strong hereditary tendency to this affection, and some time after the operation the patient remarked that his hands (both were similarly affected) had never been so perfect since the contraction had commenced many years ago. In the other case the relapse was entirely due to the careless inattention of the patient, and although I reluctantly repeated the operation the result has proved to be very satisfactory, the finger being straightened and full power of flexion preserved. This contrasts favourably with the relapsed cases after open wound, which from the nature of the cicatricial contraction are incapable of further relief, and in which the fingers are rendered permanently useless.

In a large number of cases in every department of surgery relapse will occasionally occur, and a special liability to relapse is found to exist in some affections, but this does not deter the surgeon from operating in such cases.

In Dupuytren's finger contraction it may be confidently stated that no special tendency to relapse exists, although in some cases when there is a strongly marked hereditary tendency, and also in some occurring in very gouty subjects, relapse occasionally takes place; but in both these classes I have known many cases remain permanently cured, when a tendency to relapse might have been feared.

Other causes of relapse may be found in an imperfectly performed operation, the difficulties of which, in a severe case, are much greater than generally supposed; and also in the neglect of the after-treatment by a careless patient. Many patients are very reluctant to continue wearing a retentive splint, even at night, when they once see their fingers straight; yet by thus checking the first noticeable inclination to bend, relapse may be prevented.

It is impossible to ascertain precisely the proportion of cases in which relapse occurs; or the relative proportion of such cases after the subcutaneous method, and the open wound. From my own experience, however, I believe it may be stated that nine out of ten of the cases operated upon, strictly upon the principles I have laid down, are permanently cured by the first operation, and the percentage of relapsed cases is probably about 10 per cent.—a very satisfactory result in a class of cases, in the curability of which the profession never had any confidence until the present method of treatment was adopted.

Amongst the earlier cases represented in the accompanying plates are several good illustrations of a permanent cure after one operation, the first case

in Plate 1 having been operated upon in the year 1864, and the second case in 1877. The first case remains as perfect at the present time (1891) as represented in Plate 1, Fig. 2, *i.e.*, twenty-seven years after the operation; but within the last four or five years, the ring and little fingers of the opposite hand (the left) have been gradually contracting to a severe degree. It does not, however, interfere much with the ordinary requirements of life, and at his advanced age (over seventy) he thinks it hardly worth while to submit to treatment. It is remarkable that the disposition to Dupuytren's contraction should show itself in the opposite hand, without any relapse in the hand operated upon.

The second case in Plate 1, Fig. 3, also remains at the present time (1891) quite as perfect as represented in Fig. 4, with free use of the fingers, *i.e.*, fourteen years after the operation. A slight disposition to contraction only has developed in the opposite hand.

Many other cases in the series—16 in number—I know have remained without any relapse, but in two of the cases represented relapse has occurred.

In the present essay it has been my object to give an increased confidence in the subcutaneous operation for Dupuytren's contraction of the fingers; and to point out some details and modifications in the mode of performing the operation, as well as the alterations in the after-treatment which I have been led to adopt, and upon which I believe much of the success will be found to depend.

THE END.

SECOND ESSAY.

FURTHER OBSERVATIONS ON THE TREATMENT OF
DUPUYTREN'S FINGER CONTRACTION.

SECOND ESSAY.

FURTHER OBSERVATIONS ON THE TREATMENT OF DUPUYTREN'S FINGER-CONTRACTION.

[READ BEFORE THE MEDICAL SOCIETY OF LONDON, MARCH 24TH, 1890.
REPRINTED FROM THE "MEDICAL SOCIETY'S TRANSACTIONS,"
VOL. XIII.]

MR. PRESIDENT AND GENTLEMEN,—The subject of Dupuytren's contraction of the fingers is one that has interested me for many years, and occasionally at long intervals it may be useful to review one's own personal experience, and explain any change in opinion or treatment that I may have adopted; also to notice any theories of causation suggested, and additions to the clinical history or modifications in the method of operating made by other observers.

Since the publication of my small treatise on Dupuytren's contraction,* and its treatment by subcutaneous division of all the contracted bands of the palmar fascia in the year 1879, many important contributions to the pathology and clinical history of this affection have been made, chiefly by two distinguished American surgeons, Dr. W. W. Keen, of Philadelphia, and Dr. Robert Abbé, of New York, both of whom warmly

* "Observations on Contraction of the Fingers (Dupuytren's Contraction), and its successful treatment by subcutaneous division of the Palmar Fascia, and immediate Extension," Wm. Adams, F.R.C.S., J. and A. Churchill, London, 1879.

advocated the operation, as did also Professor Louis Sayre, of New York, soon after its publication in my first paper, which I read at the Royal Medical and Chirurgical Society on the 22nd May, 1877. But previous to this, in the year 1876, during my visit to America, when I went, as the President of this Society, to attend as its representative, the International Medical Congress held in Philadelphia, I had the opportunity of discussing this subject with Professor Alfred C. Post of New York, who had at this time written a paper* on this affection, advocating the operation of open-wound, because he believed the subcutaneous operation impossible, in consequence of the adhesions of the skin to the contracted bands of fascia.

In Philadelphia I had many pleasant interviews and discussions with Dr. Keen, who was much interested not only in the subcutaneous operation for Dupuytren's finger-contraction, but other subcutaneous operations. At the Congress Meeting my attention was chiefly directed to subcutaneous osteotomy, and especially the operation of dividing subcutaneously the neck of the thigh-bone, an operation which I first performed at the Great Northern Hospital on December 1, 1869,† and which I demonstrated, and made the subject of a paper at the Congress.‡

* "On Contraction of Palmar Fascia, and of the Sheaths of the Flexor Tendons," by Alfred C. Post, M.D., New York, "Archives of Clinical Surgery," August, 1876.

† "A New Operation of Bony Ankylosis of the Hip-joint with Malposition of the Limb, by Subcutaneous Division of the Neck of the Thigh-bone," by Wm. Adams. London, J. and A. Churchill, 1871.

‡ "Transactions of the International Medical Congress of Philadelphia," 1876, p. 624, edited by John Ashhurst, Junr., Philadelphia, 1877.

In Washington the subject of Dupuytren's finger-contraction was also freely discussed, and I demonstrated the operation, but the subject of one of the "Toner Lectures,"* which I delivered was rather on the laws of subcutaneous surgery generally, and its extension to subcutaneous osteotomy, and other operations, such as the removal of depressed cicatrices, the extraction of loose cartilages from the knee-joint, &c.

Amongst the contributions by English surgeons, an important paper on the clinical history of Dupuytren's finger-contraction, describing seventy cases, was read at the Royal Medical and Chirurgical Society on March 25th, 1884,† by Mr. Noble Smith. My colleague Mr. Macready,‡ has published an able defence of the subcutaneous operation against the threatened return to the operation by open-wound with antiseptic precautions.

Of these various contributions I would speak first of that which refers to the theory of causation, and the *general pathology of Dupuytren's finger-contraction*, viz., a very important paper, written by Dr. Robert Abbé, of New York, in which he rejects the theory of its gouty origin, and seeks to establish the theory of a reflex nervous origin of this contraction consequent

* "The Toner Lectures, Lecture VI.: Subcutaneous Surgery; its principles and recent extension in practice," by Wm. Adams, F.R.C.S. Published by the Smithsonian Institution. Washington, April, 1877.

† See *The Lancet*, March 29th, 1884, and *British Medical Journal*, February 7th, 1885.

‡ "On the Treatment of Dupuytren's Contraction of the Palmar Fascia," by J. Macready, F.R.C.S., *British Medical Journal*, February 22nd, 1889.

upon a traumatic lesion. Dr. Abbé read this paper before the New York Academy of Medicine, April 17th, 1884, and it was printed in the "New York Medical Journal," April 19th and 26th, 1884.

Dr. Abbé also read another paper on the same subject, with additional cases in support of his theory, before the surgical section of the Academy of Medicine, February 13th, 1888. These two papers taken together, show conclusively that Dr. Abbé has met with, and successfully treated, a number of cases of Dupuytren's finger-contraction, associated with a series of reflex nervous symptoms and neuralgias, often of a distressing character, radiating, as it were, from the seat of the contraction along the arm, through the branches of the brachial plexus, and in one remarkable case associated with severe spinal pain. The neuroses "are secondary to the development of the palmar bands, and may be started up oftentimes by hurting these. The neuralgias and neuroses are usually relieved by operation, oftentimes as if by magic."

Dr. Abbé in the paper above referred to formulates his conclusions in the following manner. He observes, p. 4, "My conclusions resulted in the following working hypothesis to explain the disease:—

"*First*.—A slight traumatism of the palm, often entirely forgotten.

"*Second*.—A spinal impression produced by this peripheral irritation.

"*Third*.—A reflex influence to the part originally hurt, producing insensible hyperæmia, nutritive-tissue

disturbances, and new growth, shown in the contracting bands of fascia, and occasional joint-lesions resembling subacute rheumatism.

“*Fourth.*—Through the tense contractions, a second series of reflex symptoms, neuralgias, general systemic disturbances, and a reflection of the trouble to the corresponding parts of the opposite hand.”

Now, with regard to this theory of the neurotic origin of Dupuytren's finger-contraction advanced by Dr. Abbé, there can be no doubt that the series of carefully recorded cases upon which it is based, tend to the conclusions drawn by Dr. Abbé, but I cannot help thinking that they are rare and exceptional in character. In the course of my experience in England I have never met with any such cases of painful neuralgias and neurotic affections, extending along the arm, the shoulders, and in one case to the spine, as described by Dr. Abbé.

If, as Dr. Abbé* states, “in the middle and upper classes of English society gout is an almost universal legacy; in America typical gout is comparatively rare, but rheumatism very common,” I cannot help thinking that distressingly painful neuralgias, and various neurotic affections are more common in America than in England.

Dr. W. W. Keen, of Philadelphia, to whom we are indebted for the most valuable papers that have been written, with elaborate statistical tables, and also a carefully written article in “Wood's Reference Hand-

* Reprint of paper from *The New York Medical Journal*, August 19th and 26th, 1884.

book of the Medical Sciences," maintains the view of a constitutional origin, and generally gouty or rheumatic diathesis as the cause of this affection; and after referring in detail to the views of Dr. Abbé, Dr. Keen observes, p. 161, "Abbé's theory of a nervous origin seems to me only probable in so far as gout or rheumatism are possibly nervous in their remoter origin."

The result of my own experience during the last ten years, has been to confirm the views originally expressed in my treatise of 1879, and I still believe in the constitutional origin of this form of contraction of the fingers; and that the local changes depend essentially upon a gouty thickening of the palmar fascia, and its digital prolongations. It usually occurs in people of a gouty diathesis, with an hereditary tendency in many instances, to this form of finger contraction, which may often be traced through two or three generations. The patients have frequently not suffered from acute or true gout, as gout in the great toe is generally called, but they are seldom free from what Sir James Paget correctly called "the minor manifestations of gout," such as cutaneous thickenings over the knuckles; gouty, or rheumatic-gouty articular enlargements in the fingers, and other joint affections; eczema, undoubtedly of gouty origin; and other indications, such as lithic acid deposits in the urine, &c., of the same diathesis.

Rheumatism, pure and simple, whether in its acute or chronic form, I have generally excluded as a cause of this affection, though Dr. Keen states that he has seen it follow an attack of acute rheumatism.

Rheumatic Gout, however, seems still to be admitted as a border-land from a clinical point of view, and physiological chemistry has not yet separated these affections. Dupuytren's contraction of the finger is very often associated with rheumatic gout, affecting either the hip or knee-joint.

Clinical History.—Dr. Keen has contributed a valuable statistical table of 253 cases, collected from various sources, including the seventy cases recorded by Mr. Noble Smith in 1885. Mr. Smith's cases were obtained by examining 700 elderly people in workhouses. Out of 400 women, Mr. Smith found fifteen cases in which either Dupuytren's contraction existed, or there was fascial induration with thickening. This unusually large number in women helps to swell the statistical table. Dr. Keen observes: "The sex is noted in 227 cases; of these 187 were men, and only 40 in women." My own experience would not give half that number, and I should suppose the proportion of females to males would be about one in fifteen, or perhaps one in twenty cases. I have operated upon four or five ladies, and seen it in a few more. Dr. Keen has seen four and operated upon one.

In Dr. Keen's table, "the occupation is noted in 220 cases, exclusive of Noble Smith's. Of these, 49 were manual and 74 not manual." As to the relative frequency in the hands, Dr. Keen observes: "Both hands are usually affected, but in a good many cases only one hand is involved. The preference is, on the whole, for the right hand. Of 184 cases, the right

hand only was attacked 58 times, the left 23, and both hands 103 times." Dr. Keen states: "The fingers are very unequally involved, the three ulnar, and especially the ring and little fingers, bearing the brunt of the attack." The thumb and forefinger are rarely involved.

Dr. Keen observes: "Heredity is a marked feature. I find it as a family complaint in 50 out of 198 cases." With regard to gout or rheumatism, Dr. Keen observes: "In 95 cases; in 64 there was a gouty history, personal or family; in 31 it was excluded." These extracts from Dr. Keen's paper show that he has taken up the study of this affection with true American energy, and has contributed largely to its clinical history. One clinical fact that I have not seen noticed by any writer is the occasional association of Dupuytren's finger-contraction with contraction of the plantar fascia in one or both feet. I can only call to mind two cases in which I have seen this association. About five years ago, my friend, Mr. Henry Smith, of King's College Hospital, sent a man to me, a plumber by trade, who had Dupuytren's finger contraction in both hands, and contraction of the plantar fascia in both feet, causing pain and difficulty in walking. I recommended division of the fascia, if relief could not be obtained from the application of belladonna and mercurial plasters.

In August, 1887, a lady, æt. 65, consulted me on account of pain in the soles of both feet, which interfered with walking exercise, and seemed to be interfering with her general health. The plantar fascia

was tense, prominent, and contracted, not painful to light pressure, but painful in the act of walking, when the fascia would be stretched. I observed that this lady had severe Dupuytren's contraction in both hands, and explained that this afforded a clue to the contraction in the sole of the foot, which was of a similar nature. I advised belladonna and mercurial plasters, and division of the contracted fascia if these failed. This lady had become so much accustomed to the contracted condition of the fingers—chiefly the ring and little fingers—that she was unwilling to submit to any treatment for straightening them. I have not seen either of these patients since, so that I am unable to report on the progress of the cases.

TREATMENT.—As it is now generally admitted that the only chance of relief, or permanent cure, can be obtained by operation—all the contracted bands of fascia being divided—the only question remaining is, whether this is to be performed by a subcutaneous operation, or by an open wound and dissection.

The Subcutaneous Operation.—The operation which I have for many years performed, viz., the subcutaneous division of all the contracted bands of fascia that can be detected, by as many punctures as may be necessary, followed by immediate extension, or extension as rapidly as it can be carried out without causing pain, is that which I still adopt without any modification. If anything, I take more pains in finding out any contracted bands and dividing them; the number of punctures varying from six to eight in a simple case, to more than twenty in a severe

case, in which all the four fingers and the thumb are contracted. In these severe cases it is better, where practicable, to divide the operation into two stages, releasing the contraction of three fingers at one operation, leaving the thumb and index finger to be operated upon afterwards. Sometimes the fascial bands are so intimately connected that it seems better to complete the operation at one sitting. The objection of the patients to a second operation is always very great.

In making the punctures I follow strictly the rules laid down by M. Guérin, viz., to enter the knife at a little distance from the band to be divided, and altering its direction from above downwards, to a horizontal or oblique direction, so that the track made may be indirect, and more completely exclude the admission of air.

The success of this subcutaneous method has been so complete and satisfactory in every way, not only in my own hands, but those of every surgeon who has adopted it with sufficient study of all the necessary details—satisfactory as regards the absence of inflammation and suppuration, as well as in its curative powers in relieving the contraction, without in any way interfering with the tendons or impairing the free use of the fingers operated upon—that I can hardly conceive why any surgeon should desire to abandon it in favour of the old-fashioned method of open-wound practised by the older surgeons, including Dupuytren and Goyrand, before the discovery of subcutaneous surgery.

Nevertheless, there seems to be some feeling of distrust in the subcutaneous operation amongst some English surgeons, and I am sorry to say that our American friends are inclined to think the subcutaneous operation is applicable to the milder cases, and the open-wound to the more severe. This, I need hardly say, is a radical error, as the subcutaneous operation is alone applicable to the more severe cases of phalangeal contraction, and then only with the greatest care and attention to the details upon which I have insisted will the contraction in these cases be overcome.

Dr. W. W. Keen, of Philadelphia, in his ably written article in "Wood's Reference Handbook," has fallen into this error, though he has been one of the strongest advocates for the subcutaneous operation.

Dr. Robert Abbé, of New York, also, who adopted the subcutaneous operation with so much zeal, and in his paper in the *New York Medical Journal*, April 19th and 26th, 1884, said "that Adams' method leaves nothing to be desired," when writing to me in November, 1888, remarked: "In several recent cases I have uniformly resorted to open transverse cuts with the greatest satisfaction. I press a small piece of iodoform gauze into each cut, to ensure against primary union."

There can be no doubt that antiseptic surgery, and the Listerian method of dressing open-wounds, have rendered them comparatively free from the dangers which beset the earlier operations, but I am far from

being inclined to admit that the antiseptic system supersedes the subcutaneous system, when the latter can be safely applied with sufficient skill and attention to all the necessary details which the subcutaneous operation involves.

My colleague, Mr. Macready, has recently, in an ably written article,* compared the relative results of the subcutaneous operation with those obtained by open-wound in Dupuytren's finger-contraction, and has given a careful analysis of all the published cases operated upon by open-wound, according to the various methods, whether by transverse or longitudinal incision; and either by the simple division or removal by dissection of the contracted bands of fascia. From this analysis, and my own observation, there can be no doubt that the open-wound operation, with antiseptic precautions, has succeeded in some cases, such as I should describe as simple in character, *i.e.*, in which a prominent band of fascia in the palm of the hand alone required to be divided; but in the more complicated cases in which the phalangeal joints are involved, the dissection cannot be carried along the phalanges, and the results in these cases are imperfect, both as to the restoration of form and function. The open-wound operation is evidently inapplicable to these cases. Moreover, after the open-wound operation, there is the very serious danger of relapse of the deformity, in consequence of cicatricial contraction, when any further relief by operation becomes hopeless. Mr. Macready gives illustrations

* *British Medical Journal*, February, 22nd, 1889.

of a case of this kind which I had the opportunity of seeing with him, and, from the hopeless condition of the recontracted fingers, he was obliged to amputate the little finger. In the same patient Mr. Macready operated upon the opposite hand by the subcutaneous operation with complete success.

Tendency to Relapse.—Should relapse occur after the subcutaneous operation, as it occasionally will do, probably in the proportion of about one in ten cases—especially in the hereditary class, and those in which a marked constitutional tendency exists, and also in cases in which the after-treatment has been neglected by the patient--the operation can be repeated with as much certainty of relief as the first operation; and with additional care on the part of the patient, a more permanent result is often ensured. With regard to

The after-treatment.—This remains essentially the same as that which I recommended ten years ago. Indeed, I may say that in the pathology of this affection, the method of operating, and in the after-treatment, I have not found any reason for changing my views expressed ten years ago; but, on the contrary, the results in practice have been such as to confirm every principle I then laid down, and the operation has fully realised the best hopes ever expressed in its favour. In all cases of phalangeal contractions I still use the steel instrument fitted to the dorsal aspect of the hand, with prolongations along the contracted finger, or fingers, having joints corresponding to the phalangeal articulations, movable by rack-and-pinion joints.

In cases of simple palmar contraction this may be dispensed with, and a padded metal splint, capable of being bent to any curve, and altered from day to day, may be applied on the inner side of the hand and fingers, especially where only one or two fingers are involved. After the operation I still maintain mechanical extension, night and day, for a period of three weeks, allowing only a little passive movement after a fortnight. I then gradually discontinue it during the day and encourage active motion, but maintain it at night for several months by a simple form of retentive splint, which has been somewhat altered in shape, and is now exhibited.

THE END.

THIRD ESSAY.

ON CONGENITAL CONTRACTION OF THE FINGERS,
AND ITS ASSOCIATION WITH "HAMMER-TOE."
ITS PATHOLOGY AND TREATMENT.

THIRD ESSAY.

ON CONGENITAL CONTRACTION OF THE FINGERS, AND ITS ASSOCIATION WITH "HAMMER TOE," ITS PATHOLOGY AND TREATMENT.

[READ BEFORE THE MEDICAL SOCIETY OF LONDON, DEC. 8TH, 1890.
REPRINTED FROM THE "MEDICAL SOCIETY'S TRANSACTIONS," VOL. XIV.]

GENERAL REMARKS.

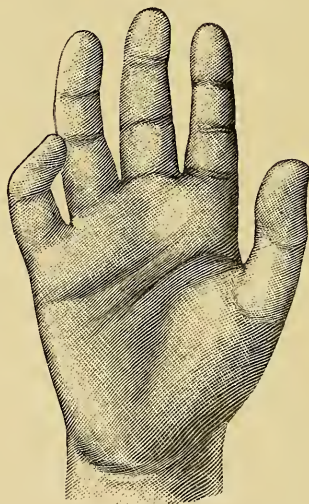
CONGENITAL contraction of the fingers—in most cases limited to the little finger—has not, hitherto, attracted much attention, and is, sometimes, not even mentioned in surgical text-books. The reason for this is that the cases, although of common occurrence, are generally unimportant, and, in the majority of instances, this contraction does not give rise to trouble, although in exceptional cases, at a late period, it does become an important affection. No one thinks anything of a crooked little finger, and, so commonly does it exist, that a gentleman once remarked to me, "All our noses and little fingers are crooked." And this is, undoubtedly, the popular notion, in which is embodied a certain amount of truth.

CLINICAL HISTORY.

This affection had better be considered in reference to three distinct stages in which this contraction is met with.

First Stage.—Although this is, undoubtedly, a congenital and hereditary affection, no deviation is observed in the little finger at the period of birth, such

FIG. 13.



Congenital contraction of little finger in first stage, in a girl, Miss Y., three years of age.

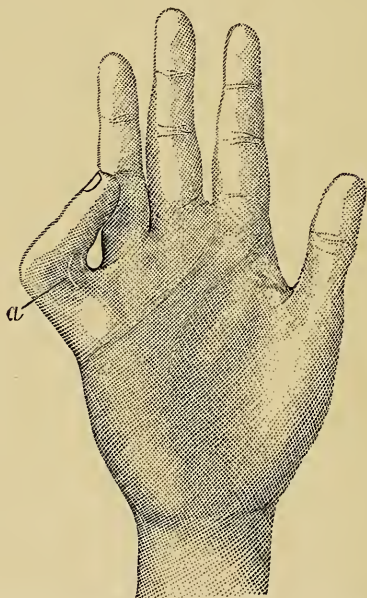
as we see in congenital club-foot, for example, and other congenital muscular contractions. I do not think I have seen any case in a child under one year of age; but I have seen many cases in children between one and two years of age. The mothers, however, have assured me they have observed it a few months after birth. This form of finger contraction occurs

chiefly in girls. The first indication observed is a dropping of the second and third phalanges of the little finger, with some inclination to turn laterally inwards towards the median line of the hand; the third phalanx is generally rather more twisted than the second. There is no evidence of muscular contraction; no contracted bands of fascia can be felt; no appearance of shortening of the skin on the palmar aspect of the fingers (see Fig. 13). The second and third phalanges can be easily restored by gentle manipulation to a straight position with the first phalanx; but they drop again as soon as the extending power is removed. This is a remarkably close resemblance to what takes place in the first stage of hammer toe. The general characters described are well represented in Fig. 13, taken from a child aged three years.

Second Stage.—This is essentially one of confirmed contraction, which takes place gradually if the malposition in the first stage has not been corrected by the child wearing a retentive metal splint. In this stage there is no evidence of muscular contraction, but some contracted bands of fascia can be detected in most cases. The second and third phalanges generally remain on the same line, and become more or less rigidly flexed upon the first phalanx, which is usually drawn backwards or hyper-extended, as shown in Figs. 14, 15 and 16. The finger cannot be straightened by any moderate amount of force, and the resistance would seem to be partly in a contracted condition of the skin and fascia, and partly in the contracted condition by adapted shortening, during growth, of the

articular ligaments. The transverse creases in the skin on the palmar aspect of the fingers corresponding to the phalangeal articulations become less distinctly marked; and the skin somewhat atrophied and thin in appearance, seems to be short and contracted. This probably led my former colleague, the late

FIG. 14.



Congenital contraction of little finger in second stage; in a young lady Miss P., nearly 10 years of age.—*a*, lateral web and fascial band in front of, and on the inner side of the first phalanx.

Mr. Tamplin, to believe in congenital contraction of the skin being the cause of this malposition; but no doubt it is only one of the secondary effects of the contraction. This stage appears to be seldom reached under 7 or 10 years of age, and even then often attracts but little attention, only being regarded as a crooked family finger. The general appearances are

well represented in Fig. 14 taken from a young lady nearly ten years of age. In this case the affection was hereditary on the father's side, and associated with hammer toe in a severe degree in one of her brothers. Later on, however, it is found to interfere more especially with music, and further advice is sought, generally about the age of 16 years.

FIG. 15.

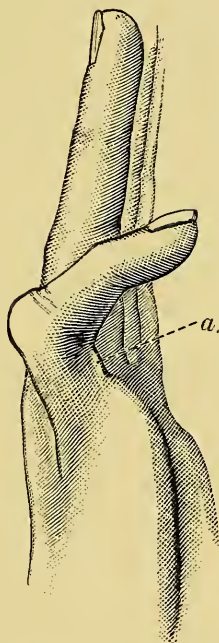
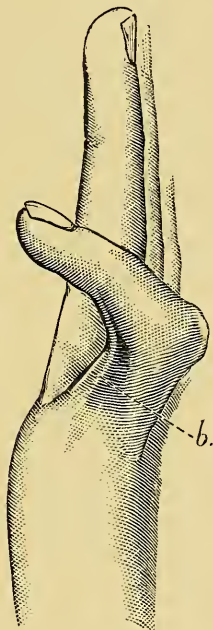


FIG. 16.



Congenital contraction of little finger arrested in second stage; in a young man aged 29 years,—*a*, lateral web and fascial band on the outer side of right little finger; and *b*, on the inner side in the left finger.

Third Stage.—When the congenital form of finger contraction has not been submitted to treatment in the first or second stage, spontaneous arrest may, and undoubtedly does, take place in many cases, as shown

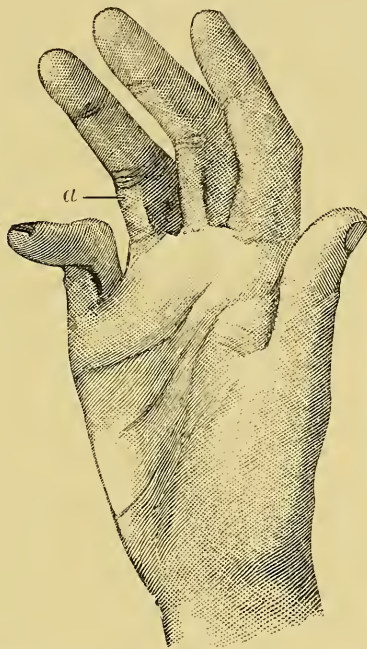
in Figs. 15 and 16, the deformity remaining throughout life without causing much inconvenience; but this cannot be relied upon, and, in a certain proportion of cases, increase of the contraction occurs at a late period—say, from 15 to 18 or 20 years of age—and these cases present several remarkable peculiarities, so that I have described this period of increase as a third stage of the congenital contraction. In this stage the increase of the contraction is seldom confined to the little finger, but all the fingers become involved; as shown in Fig. 17; and there is evidence of fascial contraction of a peculiar kind, differing widely from the fascial contraction met with in the better-known form of Dupuytren's finger contraction, as well as a further contraction and shortening of the skin.

When this increase of the contraction commences, the second and third phalanges of all the fingers begin to bend downwards, so that the hand gradually becomes less and less useful for any purpose, and in young ladies the piano has to be abandoned. It is soon found that the fingers cannot be straightened by any moderate force, and when the attempt is made the skin on the palmar aspect seems to be short and contracted. There is also some appearance of a central flat band of fascia about three-eighths of an inch in width, running lengthwise along the first and second phalanges. The margins of this band become tolerably well defined in the central portion of each phalanx, and expanding near to the articulations are gradually lost. This is well represented in Fig. 17.

. As this appearance of a central longitudinal band

does not correspond to any natural distribution of the digital prolongations of the palmar fascia, which we know pass obliquely forwards and backwards towards the periosteum along the inner and outer margins of the sheath of the flexor tendons, its explanation seems to be difficult. It appears to me to be due to the

FIG. 17.



Congenital contraction of the fingers in the third stage. From a young lady aged 17 years.—*a*, central flat bands of fascia in front of the first and second phalanges.

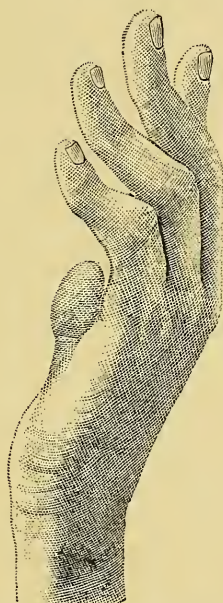
terminal fibres of the fascia inserted into the skin becoming involved, and contributing to an appearance of skin contraction. I formed this opinion after the first operation I performed on one of these cases in the year 1885, when I found it necessary, after dividing some small bands transversely, to pass the knife

horizontally under the skin and divide numerous bands passing upwards towards the skin. The appearances in this case are well represented in Fig. 20. In the little finger there is an appearance in many cases of a contracted lateral band of fascia, generally on the outer side, but I have seen it less distinctly marked on the inner side of the little finger. This lateral band, however, takes a longitudinal direction, as shown in Figs. 14, 15, 16 and 20, and in this respect differs from the contracted lateral band in cases of Dupuytren's finger contraction, and has not the effect of drawing down the first phalanx, which is generally drawn backwards, or hyper-extended. In a few cases the contraction increases to a severe degree, so that the second and third phalanges become bent upon the first at a right angle as in Fig. 17 without any appearance of a lateral band.

As a condition rarely met with in these cases of congenital finger contraction, the third phalanx is horned upwards and hyper-extended upon the second to about an angle of 45° as shown in Fig. 18—the only example of the kind which has come under my observation. We see this condition in the most severe cases of Dupuytren's contraction, when some foreign body such as a piece of cork, has been wedged under the contracted finger, to prevent the nail from penetrating the palm of the hand, as shown in Plate 6, Fig. 1. In the case represented, Miss W—, nothing of this kind had occurred, nor had she been accustomed to excessive practice on the piano. The finger contraction was hereditary on the father's side; his little

finger is now arrested in the second stage of contraction, and his sister and her children are similarly affected. Miss W— has been a patient of mine for many years for a paralytic condition of both feet with deformity, the result of infantile paralysis in its most severe form, both legs being paralysed, as well as the

FIG. 18.



Congenital contraction of the middle, ring, and little fingers of left hand in the third stage ; the third phalanx of each finger horned upwards. In a lady Miss W., aged 34 years.

muscles of the trunk, giving rise to a severe form of lateral curvature of the spine ; and to some extent also the muscles of the upper extremities were involved in the paralysis.

The finger contraction has been steadily increasing of late years, the second phalanx being flexed upon the first at a right angle, with the usual appearance of a

web of contracted skin, and of some longitudinal bands of contracted fascia on the palmar aspect. Mr. Macready was interested in the case, and kindly took a photograph of the left hand from which the woodcut Fig. 18 was taken.

Opportunities of demonstrating by dissection the anatomical conditions in these cases can very seldom occur, but my colleague Mr. Lockwood dissected one which occurred in a young woman, aged 21, in whom both little fingers had been contracted from childhood, and in consequence of the increase of contraction during the last two years she was anxious to have the little finger removed, an operation which Mr. Lockwood performed, having first tried a subcutaneous division of the fascia without benefit. The specimen was exhibited to the Pathological Society on November 17th, 1885, and the report in the Transactions of the Society for 1886 states "it was found that the band in question consisted of a thickening of the digital fascia opposite the flexor aspect of the proximal interphalangeal joint. Except that it was thickened and shortened, the fascia was perfectly natural." The specimen is in the Museum of St. Bartholomew's Hospital, No. 1203, B. This period of increase, or the third stage as I have described it, seems to occur more frequently in young ladies of a neurotic temperament, simultaneously with some loss of health from overwork at school, or natural inclination to study, independently of any constitutional tendency to gout or rheumatism, although I have known parents ascribe it to rheumatism and residence in cold and damp situations.

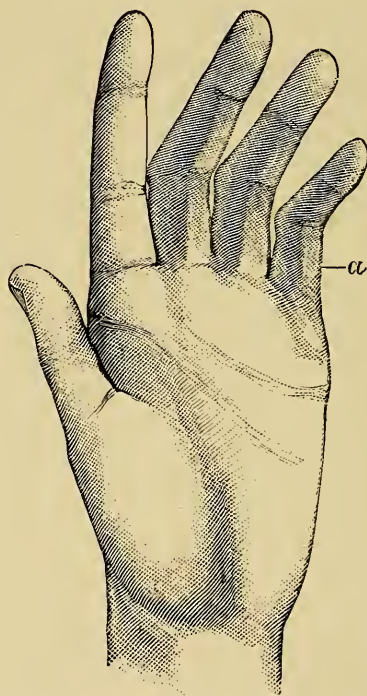
ETIOLOGY.

No satisfactory theory of causation of this peculiar form of finger contraction has yet been offered. It used to be thought to depend upon a congenital deficiency of the skin in the direction of the length of the finger—*i.e.*, an inclination to a web in the length of the finger. My former colleague Mr. R. W. Tamplin, the late Senior Surgeon of the Royal Orthopædic Hospital, in his lecture on “Contraction of the Fingers,” observes:* “In the congenital form I have not witnessed a case that arose from contraction of the muscles. The cases that I have as yet seen have been occasioned by a deficiency of skin extending from the extremity of the metacarpal bones to the last phalanx (*vide* Fig. 54).” This, by the way, is a good illustration of the ordinary form of congenital contraction, in the third stage, in a young adult, chiefly affecting the little finger; though the other three fingers are also somewhat flexed. It is remarkable that in the same lecture two excellent illustrations are given (Fig. 60 and 61) of a case which Mr. Tamplin considered to be a non-congenital contraction of the skin in the length of the fingers in an adult (see Fig. 19), but I have not the least doubt that this was a congenital case, with fascial and skin contraction coming on at a late period; one of the exceptional class of cases I have described as reaching the third stage of this form of contraction, and of which an exact counterpart may be seen illustrated in Fig. 17.

* “Lectures on the Nature and Treatment of Deformities,” by R. W. Tamplin. London: Longmans and Co., 1846.

Against this theory it may be urged that there is no appearance of congenital skin contraction, or the formation of a longitudinal web in the finger, when seen in early childhood. I have casts taken from young children that show the transverse creases on the palmar

FIG. 19.



Case recorded by Tamplin as "non-congenital contraction of the skin."*—*a*, central flat band of skin and fascia in front of the first and second phalanges.

aspect of the phalangeal articulations as well defined as they naturally should be. At a later period, when the second stage—viz., that of confirmed contraction—has been reached, the skin appears to be short, and a

* In Fig. 19 the front and side views represented in Fig. 60 and 61, Tamplin, are combined to show the finger contraction as well as the central bands of fascia in front of the phalanges.

longitudinal web becomes apparent when an attempt is made to straighten the finger. It is, I think, from cases in this stage that the opinion must have been formed, but I have no doubt that the skin contraction is a secondary affection, and with it also the terminal cutaneous filaments of the fascia, become involved. The only defect which is apparent in the first stage is a dropping of the second and third phalanges (shown in Fig. 13), apparently from some failure of the power of extension, as in the first stage of "hammer toe," with which it is frequently associated; but whether this is due to any failure or imperfect development of the lumbricales and interossei muscles, whose special office it is to aid in the power of extending the second and third phalanges, I am unable to say. Should this be the case, it is worthy of remark that the power of extending the second and third phalanges is not permanently lost through life. If we examine a case in the second or third stage by fixing the first phalanx in the flexed position (as when the hand is clenched), and then ask the patient to extend the second and third phalanges, it will be found that he is able to do this, although the power is always feeble—in part no doubt from disuse. The young man, aged 29 years, whose hands are represented in Figs. 15 and 16, has this power to a very useful extent as a wood engraver.

From the description given above, it will be at once apparent that this congenital form of finger contraction is not in any way allied to Dupuytren's finger contraction, from which it differs in its etiology

and general pathology ; in being a congenital affection, whilst Dupuytren's contraction belongs to adult life ; in affecting chiefly the female instead of the male sex ; and also in its anatomical characters, and difference in the structures involved, as neither the central portion of the palmar fascia nor its lateral digital prolongations are ever involved in the congenital form. The first phalanx is therefore never drawn down, but as a rule is hyper-extended. With these differences are also corresponding differences in the principles of treatment.

ASSOCIATION WITH HAMMER TOE.

For many years I have observed that congenital contraction of the fingers is frequently associated with hammer toe, occurring either in the same individual or in members of the same family. This occurs too frequently to be merely accidental ; but what the relation of the association may be I am unable to say. It is, however, remarkable that these two affections have in the early stage their most prominent feature in common, viz., a defective power of extending the second and third phalanges, and this occurs equally in the little finger and the hammer toe, usually the second but sometimes the third toe. It would in this stage be correct to speak of them as a "dropped finger" and a "dropped toe." In one family I am now attending there are four cases of congenital finger contraction (two sons and two daughters) and two cases of hammer toe ; one of these, with hammer toe in both feet, is associated with a

slight degree of finger contraction in both hands. This occurs in one of the daughters, aged 17; the other hammer toe case occurs in the father. It is not known that either of these affections occurred in the previous generation. In another family I attended many years ago three daughters suffered from congenital contraction of the fingers, and one from hammer toe. I have casts of two of these cases, and one is represented in Fig. 17. The elder brother suffered from a severe degree of hammer toe: he had been operated upon, without benefit, by division of the flexor tendons before he came under my care in January, 1878, but I completely cured the case by division of the lateral ligaments. He was an officer in the Foot Guards, and it seriously interfered with his military duties. I quoted this case in the paper on the Treatment of Hammer Toe I read before this Society on March 19th, 1888.* Both these affections were known to be hereditary in the family.

The assistant to the artist who has prepared the illustrations to this paper, a young man, aged 29, happens to have two contracted little fingers represented in Figs. 15 and 16; and, observing this recently, I asked him about any case of hammer toe occurring in his family, when he told me that he had two hammer toes. His father also had two contracted little fingers, but he did not know whether he had hammer toe. Both little fingers are in the second stage, with the appearance of a lateral web and fascial band on the outer

* This paper is reprinted in the present edition, as the fourth essay. "Proceedings of the Medical Society of London," vol. xi., 1888, p. 252.

side in the right finger, and on the inner side in the left finger, as shown in Figs. 15 and 16. He finds no inconvenience from the contraction ; but, on the contrary, thinks the contracted little fingers rather more useful than straight ones in holding large flat-headed tools used in wood engraving, and thought they might be called the “wood engravers’ little fingers.” In the case of a young lady, Miss P., nearly 10 years of age whose hand is represented in Fig. 14, the finger contraction is said to be hereditary on the father’s side, and her brother *æt.* 23 years is suffering from hammer toe in the left foot in a severe degree. This association of congenital contraction of the fingers with hammer toe I have seen in many other instances.

HEREDITY.

The hereditary character of the congenital contractions of the fingers, of which several examples have already been mentioned, appears to be well known, but so lightly regarded that medical attention is seldom directed to them ; doubtless because in a considerable number of cases spontaneous arrest takes place, and the contraction does not advance to a degree which would cause inconvenience. Sometimes, however, young children are brought to us in consequence of the contraction in other members of the family having given rise to some trouble. In the case of Miss Y——, aged 3 years (see Fig. 13), it was well known to have occurred in several members of the father’s family. This child had congenital contrac-

tion of both little fingers, and was brought from India in the year 1854, as it was thought that some operation might be performed. The late Mr. Joseph Henry Green was consulted, together with Mr. William Freeman, of Spring Gardens. They suggested that I should see the case before any decision was arrived at. Upon examining the case at another consultation, I found there was no evidence of contraction either of the tendons or skin, and the little finger in each hand could easily be restored to the straight position, though the second and third phalanges immediately dropped again. My opinion was therefore against any operation, and in favour only of a retentive finger splint, which was worn day and night for a lengthened period, and at night only for several years. This child was one of a large family, consisting of eight girls and five boys; all the girls are said to have suffered from finger contraction in various degrees, and two of the boys had also contraction of the little fingers, but not in a severe degree.

After losing sight of this patient for many years, I had the opportunity of seeing her and examining the hands again in June, 1890. She is about 38 years of age. The little fingers are not quite straight, the second and third phalanges being a little bent, more especially the third phalanx, but this can be easily restored to a nearly straight position; the voluntary extension power is, however, feeble. It is satisfactory to find that the fingers have not passed into any confirmed contraction, and there is no appearance of a lateral cutaneous web. None of the other fingers have

become involved. She is able to stretch an octave with the ring instead of the little finger, but she can use this in playing. There is one remarkable feature in this case which I have not seen in any other instance, viz., that both the little finger and thumb in each hand have been somewhat arrested in their development, and are now very perceptibly shorter than they ought to be, evidently showing some developmental defect.

TREATMENT.

The treatment of the congenital form of finger contraction must be described in reference to the three stages through which this affection may pass, though it only reaches the third, the latest stage, in a certain proportion of cases.

In the *first stage*, in which the little finger only is affected, the treatment is essentially preventive, the object being to prevent the dropped finger falling into a stage of confirmed contraction with all its inconveniences. This can only be done by the child wearing a light retentive metal splint for a lengthened period, at first day and night, or for a considerable portion of the day, and at night probably for two or three years, or perhaps longer. The finger and hand should be well rubbed and exercised three times a day. The retentive splint may be like either that represented in Fig. 23, or, in a more simple form, a piece of whalebone or steel may be worn inside the finger of a glove.

In the *second stage*—viz., that of confirmed contraction, also generally confined to the little finger,

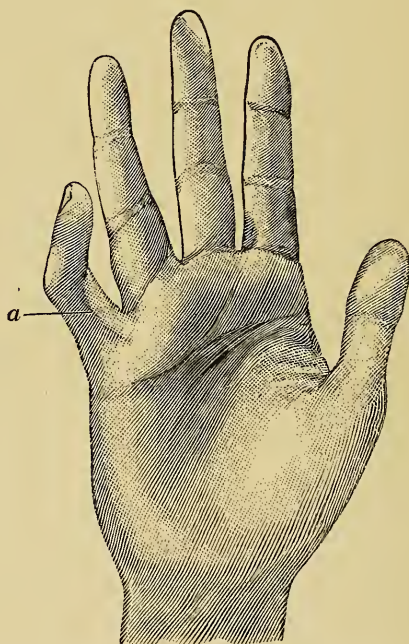
but seldom reached under 10 years of age—the object of treatment is to overcome the contraction, and restore the finger to the straight position.

Here, then, the question may be asked whether this should be accomplished by long-continued mechanical extension alone; or by the division of any bands of fascia that can be detected, followed by mechanical extension? For many years I followed the teaching of my predecessors, and opposed the idea of any good being done by operation; but, in May, 1885, my friend Dr. Maughan brought a lady, Miss D—, aged 23, to me, with both little fingers in the second stage of congenital contraction; and the right, represented in Fig. 20, was so unsightly, and its usefulness so much impaired, that she was anxious to have it straightened if possible. A band of fascia could be distinctly traced beneath the skin, and this I decided to divide before commencing the extension. The prominent contracted band is well shown in Fig. 20. A marked improvement followed the division of this band, as well as of a number of short contracted bands passing upwards towards the skin. Mechanical extension was then carried on for two or three months, and the finger brought into a straight position. A retentive splint was afterwards worn at night for a long time, and a very satisfactory result was obtained, so that since then I have always adopted this plan in suitable cases.

In many cases of congenital finger contraction in the second stage, beneath the prominent cutaneous web, which frequently runs along the margin

of the little finger, one or more small but distinct bands of fascia may be felt, running longitudinally in the direction of the web. These should be divided by the point of the smallest fascia knife, cutting the band or bands transversely; but further relief to the contraction will be gained by cutting

FIG. 20.

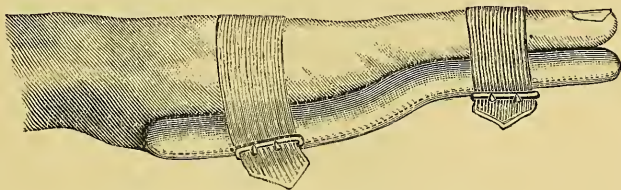


Congenital contraction of little finger in the second stage, with a contracted band of fascia, *a*, near to the median line.

horizontally under the skin, and dividing numerous small but tense bands of fascia, evidently the terminal branches passing towards the skin. Two or three punctures will probably be required opposite the first phalau, and two or three opposite the second. Small

compresses and plaster should be applied, and the finger bandaged to a flexible metal splint, well padded and applied so as to make some extension, as shown in Fig. 21. but the extension should at first be less than represented. When immediate extension cannot be carried out to the full extent required, then on the third day an instrument for making extension should be put on, and the stretching process commenced and carried out as rapidly as it can be borne without producing pain, or pressure sores. The principle in all fascia divisions is that of immediate extension, but in practice this cannot always be carried out. The

FIG. 21.

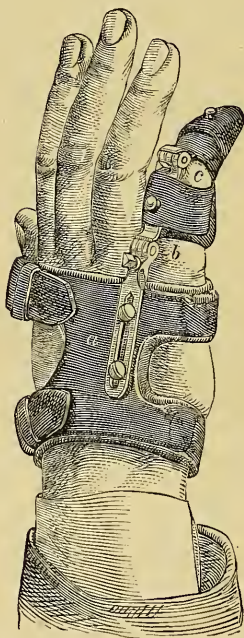


Padded metal splint, as applied after the operation.

instrument I prefer is the same as that used for Dupuytren's finger contraction, shown in Fig. 22, consisting of a dorsal plate from which levers are carried along the fingers, and these are moved by rack-and-pinion joints corresponding to the phalangeal articulations. The patient may be taught to a great extent to manage this in a few days so as either to release or increase the extension, as it can be borne without pain, but at first the surgeon should regulate this daily. This extension instrument must be worn

day and night for a period varying from three to six months, according to the severity of the case, as not only the skin but the deep ligamentous structures yield very slowly to extension, and would quickly relapse if the extension was discontinued too early; but it may be taken off daily for the purpose of wash-

FIG. 22.



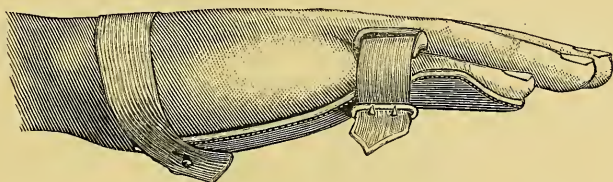
Extension instrument, with rack-and-pinion movements, to be used three days after the operation.

ing and a little exercise. When the extension is complete, the instrument may be gradually discontinued. A simple form of metal retentive splint applied on the palmar aspect, like that used for Dupuytren's contraction, as represented in Fig. 23

may be worn for a short time with slight intermissions, and then at night only. This must be continued for many months, till the fingers during the day's use show no disposition to bend, and the muscles as well as all the tissues involved have become accustomed to the straight position.

In the *third stage*—in which, in addition to the little finger, the middle and ring fingers are always involved, and occasionally also the index finger is somewhat contracted, these fingers being drawn down in some cases at a late period of increase, say, from 16 to 18 or 20 years of age—the operative and mechanical

FIG. 23.

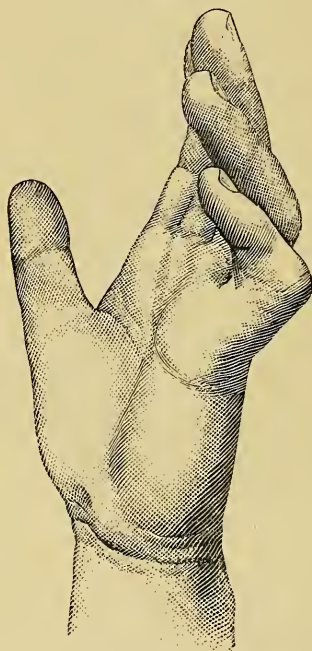


Metal retentive splint, to be used when extension is complete.

treatment are both essentially the same as that already described in the second stage. All the fingers involved should be operated upon at the same time, a careful division being made of the longitudinal bands running on either side of the median line of the first and second phalanges, and the terminal cutaneous fibres connected with them, which seem to give the appearance of an elongated square, flattened band in the centre of each phalanx. The after mechanical treatment is precisely similar to that described in the

second stage, but the extension instrument adapted to all the fingers should be worn night and day for a period of from three to six months, according to the severity of the case and the age of the patient. Several cases have been successfully treated in the third stage.

FIG. 24.

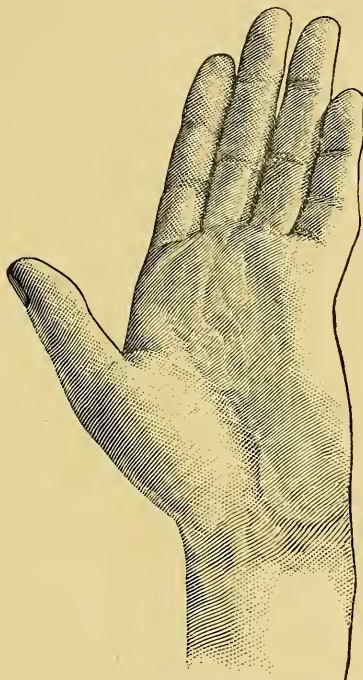


Congenital contraction of all the fingers in the third stage, in a lady aged 23.
Before operation.

In one of these cases occurring in a young lady aged 23, in whom both hands were affected (and the left hand is represented in Fig. 24), this treatment was rigidly carried out for six months, the extension instrument being worn night and day, but removed for washing and exercises every day, and the

retentive metal splint is still used at night. The photograph showing the improvement after treatment, from which Fig. 25, is copied, was taken by my colleague Mr. Macready (who has assisted me in many of these operations, and has carefully studied both the

FIG. 25.



From the same case as Fig. 24, eight months after operation, showing the complete removal of all contraction

Dupuytren and the congenital finger contraction), about eight months after the operation, in April, 1890, and up to the present time (October, 1891), the improvement has been fully maintained, and she has full use of the fingers in playing the piano, &c. The right

hand, somewhat less contracted than the left, is now undergoing similar treatment, which I have no doubt will be equally successful.

In conclusion, my experience clearly proves that when taken in the first stage contraction may be prevented by mechanical means alone; and that either in the second stage, when the contraction is confined to the little finger, and has become spontaneously arrested with deformity; or in the third stage, when contraction increases from 16 to 20 years of age, and all the fingers become involved, a complete cure may be obtained by operation followed by a long course of mechanical treatment. The extension apparatus must be worn day and night for a period of from three to six months after the operation, and a metal retentive splint, adapted to all the fingers, afterwards at night for some months. We may, therefore, consider that this congenital contraction of the fingers, like Dupuytren's contraction previously described, has now been brought fairly under the control of the surgeon.

PLATE VII.

FIG. 1.

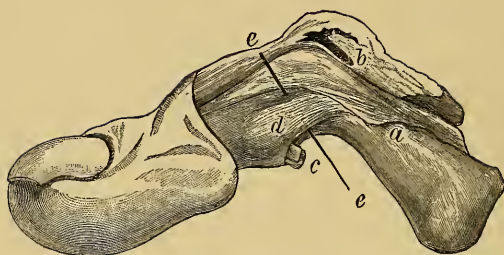
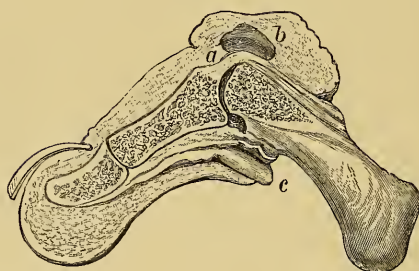
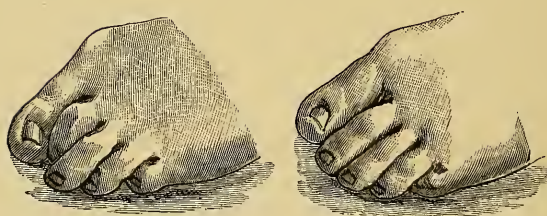


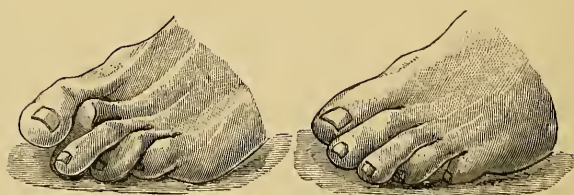
FIG. 2.



FIGS. 3 and 4.



FIGS. 5 and 6.



DESCRIPTION OF PLATE VII., WITH NOTES OF CASES.

Fig. 1.—Hammer-toe dissected and drawn by Mr. S. G. Shattock, the soft parts remaining *in situ*. The second phalanx is flexed nearly to a right angle with the first, and the third phalanx remains in a straight line with the second.

On the dorsal surface the extensor tendons and their aponeurotic expansion *a* are shown passing over the articulation, between the first and second phalanges.

Directly over the joint between the first and second phalanges, and between the tendinous aponeurosis and the skin, a bursa *b* has been developed, and a considerable amount of cutaneous and subcutaneous infiltration and thickening is shown in its neighbourhood.

On the plantar aspect the flexor tendons *c* have been divided, and their distal extremities are shown.

The lateral ligament *d* has been dissected, and a bristle *e e* passed beneath it. This ligament, in a condition of adapted shortening, is seen passing across the angle of flexion, in the concavity of the curve, and maintains the contraction of the toe after the flexor tendons have been divided.

Fig. 2.—Hammer-toe dissected and drawn by Mr. S. G. Shattock. A longitudinal section has been made through the bones and the articulation between the first and second phalanges. The second phalanx is flexed nearly to a right angle with the first, and the third phalanx remains in a straight line with the second.

On the dorsal surface the central portion of the extensor longus tendon *a* is shown passing to its insertion into the base of the second phalanx.

Directly over the joint between the first and second phalanges, and between the tendinous aponeurotic expansion and the skin, a bursa *b* has been developed, and a considerable amount of cutaneous and subcutaneous infiltration and thickening is shown in its neighbourhood.

On the plantar aspect the divided extremities of the flexor tendons *c* are shown, and the capsular ligament appears to be thickened.

The articulation is perfectly healthy, and the articular surfaces of the bones not materially altered.

Fig. 3.—Hammer-toe occurring in the second toe of the left foot, and presenting the characters generally met with. The second and third phalanges are flexed nearly at a right angle with the first, and wedged in between the great toe and the third toe.

The patient, Lotus Wyatt, æt. 18, a governess, was admitted to the Great Northern Central Hospital on May 15th, 1887. A similar condition, but to a less extent, existed in the right foot. The contraction had latterly increased, and greatly interfered with her walking powers and occupation. Her maternal uncle had hammer-toe.

On May 18th, 1887, Mr. Adams operated upon the left foot by subcutaneous division of the lateral ligaments, without dividing the flexor tendons. The toe was easily straightened, and the improved position maintained by a small padded metal splint, bent to the shape of the foot and toe. No inflammation followed.

On June 15th Mr. Adams operated upon the right foot, which progressed as favourably as the other, and on July 7th, 1887, she was discharged cured. The treatment was carefully carried out by Mr. Alexander M. Cowie, the house surgeon.

*Fig. 4.—*Represents the same foot as shown in Fig. 3, after treatment. The operation was on the 18th May, 1887, and the cast showing the improvement, from which the drawing was made, was taken on the 25th June, 1887.

Fig. 5.—*Hammer-toe* occurring in the second toe of the left foot, and presenting the exaggerated characters met with after the adult period of life. The second and third phalanges are flexed fully to a right angle with the first; and the first phalanx is also drawn upwards by the action of the extensor tendons, so that the angle of flexion between the first and second phalanges is rendered more acute and prominent. A painful corn forming on the apex of the contraction, renders the patient unable to bear the pressure of any boot, and the walking powers are therefore seriously interfered with. This occurred in a marked degree in the present instance.

The patient, a woman *æt.* 27 years, was admitted into the Great Northern Central Hospital on the 7th November, 1886. The contraction had existed for many years, but had increased of late; she was not aware of any other case in the family; both feet were similarly affected. On 10th November Mr. Adams performed the operation on the left foot, at first dividing only the lateral ligaments, but as the contraction was not completely removed, he divided the flexor tendons and some ligamentous fibres in front of the joint. The toe was completely straightened, and the improved position maintained by a small padded metal splint; no inflammation followed. The other foot was operated upon shortly afterwards, and both toes were quite straight when she left the hospital. The treatment was carefully carried out by Mr. A. F. Whitwell, the house surgeon.

Fig. 6.—Represents the same foot as shown in *Fig. 5*, after treatment. The operation was performed on November 10th, 1886, and the cast showing the improvement, from which the drawing was made, was taken December 8th, 1886.

PLATE VIII.



Fig 1.



Fig 2



Fig 3.

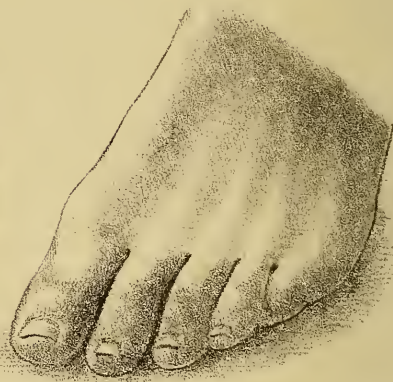


Fig 4



Fig 1 A



Fig 3 A

DESCRIPTION OF PLATE VIII., WITH NOTES OF CASES.

Fig. 1 and Fig. 1A.—Hammer-toe in an unusually severe form, in the second toe of the left foot in a young gentleman, *æt.* 12 years, sent to me by my friend, Mr. Buxton Shillitoe, on March 29th, 1890. The second phalanx was contracted to a right angle with the first, and the third phalanx was contracted to a right angle with the second, so that he trod upon the upper surface of the toe nail, as shown in *Fig. 1A*.

The inconvenience in ordinary walking and in all games and exercises was so great that some treatment was urgently called for, and Mr. Shillitoe doubted whether anything short of amputation would be sufficient. I advised the subcutaneous division of the lateral ligaments.

On the 24th April, 1890, I performed the operation with the assistance of Mr. Shillitoe. After dividing the lateral ligaments at both the phalangeal articulations, *i.e.*, between the first and second phalanges, and also between the second and third phalanges, the toe was readily brought into a straight position.

On the third day after the operation the metal sole-plate represented in *Fig. 26* was applied, and extension rapidly made. After three weeks this was used only at night, and the patient began to walk a little in the day time, wearing the retentive metal splint represented in *Fig. 27*. This was gradually discontinued, but the metal sole-plate was worn at night for six months. The result was perfectly successful, as shown in *Fig. 2*.

Fig. 2.—This drawing from a model taken three months after the operation shows the hammer-toe completely restored to the naturally straight position. The other toes, which had been separately extended in the metal sole-plate, as in these toes, I generally find a disposition to twist inwards, are also shown to be greatly improved. I have seen this young gentleman very recently, and the foot is quite perfect, without the slightest disposition to any recontraction.

Figs. 3 and 3A.—Hammer-toe in its most severe and most painful form in a gentleman, *æt.* 27, who was sent me by my friend, Dr. Maclaren, of Harley Street, on the 4th April, 1889. This gentleman had suffered from hammer-toe in both feet from childhood, affecting the second toe, but it was not known to be hereditary. Of late years it had become a serious trouble to him by interfering with walking exercise and sports, to which he was much given. He had recently returned from a tour in India, during which he suffered severely from a corn or excrescence formed on the dorsal surface of the contracted toe. No boots could be so adapted as to avoid pressure on the contracted toe, and after his return from India the opinions of the leading surgeons in London and Edinburgh had been taken, with the result that all agreed in advising amputation. Before consenting to this Dr. Maclaren advised his patient to take my opinion, and I said that although in adult life a cure could be less depended upon by a subcutaneous operation, still it should first be tried, and if it failed re-section of the joint would be sure to succeed, and amputation would be avoided.

In both feet the hammer-toe presented the usual characters, and they were about equal in severity. The first phalanx was drawn upwards or hyper extended in a very marked degree, as shown in *Fig. 3*, and the second and third phalanges, which remained on a straight line with each other, were flexed at an acute angle with the first phalanx. The effect of this was to bring the extremity of the toe in direct contact with the ground, and the extremity thus became flattened and expanded, the toe nail being worn down to a square

outline, altogether presenting an appearance not unlike a "hammer-head," from which the term "hammer-toe" might have been taken. These characters are well exhibited in Fig. 3A, drawn natural size, and the outline taken from a plaster of Paris model.

Directly over the joint between the first and second phalanges, corresponding to the acute angle of flexion, was an elevated mass of cutaneous and subcutaneous thickening and infiltration of tissue, beneath which a bursa had been developed, as shown on Plate VII., Figs. 1 and 2. Any pressure at this point caused acute pain. In the left foot I removed this cutaneous thickening by the use of the acetic acid corn solvent, a fortnight before operating, and in this process the acid opened the subcutaneous bursa, from which about thirty or forty drops of fluid escaped. A little pressure could, therefore, be used occasionally, with a soft pad over the joint, as a relief to the pressure on the dorsal surface of the first phalanx.

On the 12th April, 1889, I operated on the "hammer-toe" of the right foot, with the assistance of Dr. Maclaren and Mr. Macready. The lateral ligaments were divided freely, and also some of the thickened ligamentous structures in front of the joint, without completely dividing the flexor tendons. On the third day the metal sole-plate represented in Fig. 26 was applied, and worn night and day for five weeks, when a little walking exercise was allowed, the retentive metal splint represented in Fig. 27 being used for a portion of the day, and the metal sole-plate at night for six months or more.

On the 16th May, 1889, I operated on the "hammer-toe" of the left foot, the after treatment being the same as that in the right, and the result in both feet was equally good.

Fig. 4.—This drawing, taken some time after the treatment, shows the "hammer-toe" completely restored to its naturally straight position, and the other toes greatly improved by being kept in a straight position during the treatment.

FOURTH ESSAY.

ON THE SUCCESSFUL TREATMENT OF "HAMMER
TOE" BY THE SUBCUTANEOUS DIVISION OF THE
LATERAL LIGAMENTS.

FOURTH ESSAY.

ON THE SUCCESSFUL TREATMENT OF "HAMMER-TOE" BY THE SUBCUTANEOUS DIVISION OF THE LATERAL LIGAMENTS.

[READ BEFORE THE MEDICAL SOCIETY OF LONDON, MARCH 19TH, 1888, AND
REPRINTED FROM THE "MEDICAL SOCIETY'S PROCEEDINGS,"
VOL. XI.]

MR. PRESIDENT AND GENTLEMEN,—This evening I propose to describe a subcutaneous operation which I have practised successfully many years, for the relief of contraction with deformity, usually affecting the second toe, and well known under the name of "hammer-toe," by which Sir A. Cooper described it. Why so designated it is difficult to explain, though possibly as the extremity of the contracted toe, wedged in between the great toe and third toe, is usually in contact with the ground, and becomes flattened and expanded as shown in Plate 8, Fig. 3A, some fancied resemblance to a hammer-head may have been traced.

Essentially it is an hereditary affection, frequently traceable through two or three generations, and when existing in a severe degree in one member of a family,

it may often be found, though to a less extent, in the other children. It is often symmetrical, and sometimes equally severe in both feet, but generally the contraction is much less confirmed in one foot than the other. Occasionally the third toe is the seat of this "hammer-toe" contraction, and sometimes an inclination to it is also observed in all the four outer toes.

It is certainly not traceable to the child wearing short boots or shoes. I have frequently seen it when the greatest care has been taken that the boots worn by the child should be of full length. Mr. T. Nunn considers it to be of neurotic origin, but its pathology still seems to be obscure.

It may frequently be seen, in an early stage, in children about five years of age, and gradually increases, becoming well marked about 10 years of age; but still the apparently contracted toe can easily be straightened by a little manipulation, without any resistance being offered. There is no evidence of any muscular contraction. It is chiefly to be observed that the child has no power of extending the second and third phalanges, which seem to have a disposition to drop into a state of flexion and contraction. This is certainly not due to any failure of power in the extensor muscles, the tendons of which it is frequently necessary to divide in severe cases, in which the first phalanx is drawn upwards. Whether any failure of power exists in the lumbricales or interossei, whose special office it is to aid in the power of extending the second and third phalanges, I am unable to say, but the question is one deserving further attention.

The "hammer-toe" deformity seldom becomes fully developed under the age of 15, and then the second phalanx is found to be rigidly flexed at a right angle to the first, and resists all attempts to straighten it by manipulation; the third phalanx is usually continuous in a straight line with the second, and thus the extremity of the toe comes directly in contact with the ground, and gradually assumes a flattened and expanded form, the toe-nail becoming diminished in size and square in shape. Some deviation as regards the third phalanx will occasionally be found, and in some severe cases the third phalanx becomes rigidly flexed at a right angle to the second, so that the dorsal surface of the nail is brought in contact with the ground. This is well represented in Plate 8, Figs. 1 and 1A. drawn from the casts taken. In such a case the ligaments will require division at both articulations, *i.e.*, between the first and second, and also between the second and third phalanges.

The skin in the concavity of the contraction appears to be thin and atrophic, especially when put a little on the stretch; then it seems to be too short to allow of complete extension of the second and third phalanges without rupture—an accident that does occasionally occur if too much force be used suddenly. With care this accident may generally be avoided. It has been thought that a congenital deficiency or shortening of the skin in the direction of the length of the toe has been the cause of this contraction, but there is hardly sufficient evidence to support this theory, and I have always regarded the atrophic and shortened condition

of the skin as an effect, rather than a cause, though it must be admitted that it exists long before the contraction becomes confirmed.

In consequence of the deflection of the second and third phalanges, when these remain continuous in a straight line, the first phalanx is necessarily pushed, rather than actively drawn, upwards; but in the course of two or three years the extensor tendon becomes prominent and assists in retaining the first phalanx in its uplifted position.

The prominence of the angle of flexion between the first and second phalanges becomes a source of pain and inconvenience from pressure; boots are worn with increasing difficulty, and walking proportionably impeded. At first inflammatory thickening takes place, and a troublesome corn is formed; under this a bursa is developed, as shown in Mr. Shattock's dissections (Plate 7, Figs. 1 and 2), and this is subject to distension and inflammation, often leading to ulceration, when surgical aid is necessarily sought. The surgeon has then to decide which operation out of several methods proposed is especially applicable to the case.

I am the more desirous of bringing this subject before the members of this Society, because two important contributions directly bearing upon the method of operating have recently been made to our knowledge of this deformity; one describing the pathological conditions met with on dissection by Mr. S. G. Shattock of St. Thomas's Hospital, who had the opportunity of dissecting two "hammer-toes" which

had been recently amputated in the hospital, and the conditions met with are accurately represented from his own drawings in Plate 7, Figs. 1 and 2; and the other a valuable contribution, not only to the clinical history and pathology of this affection, by Mr. Wm. Anderson, also of St. Thomas's Hospital, but describing an operation for its relief by removing the head of the first phalanx, *i.e.*, a partial resection of the joint, applicable to some cases, and entirely superseding the necessity for amputation. Mr. Shattock's dissected specimens were exhibited to the Pathological Society, December 21st, 1886, and published in "Trans. Path. Soc.," vol. xxxviii., 1887, p. 449. Mr. Anderson's paper was read at the Clinical Society, May 27th, 1887, and published in "Trans. Clin. Soc.," vol. xx., 1887, p. 248, with a plate at p. 194 (Plate 5).

Mr. Shattock by his dissections proved that this deformity, which is characterised by a flexion of the second phalanx, and sometimes also of the third, upon the first phalanx of the toe, essentially depends upon a contracted condition of the lateral ligaments of the joint or joints involved, and not upon contraction of the flexor tendons or any digital prolongations of the plantar fascia to which the contraction has been ascribed by some authors (see Plate 7, Figs. 1 and 2). I never had the opportunity of dissecting "hammer-toe," but Mr. Shattock's dissection affords the strongest possible confirmation of the opinion I had arrived at from clinical observations alone, having repeatedly seen the failure of the ordinary operation of dividing the flexor tendons.

The operation which I have successfully performed for many years, essentially consists in the subcutaneous division of the lateral ligaments of the joint. I use the smallest fascia knife, with a straight-cutting edge to the point, which is always preferable to the ordinary tenotomy knife with a central point, when any fascia or ligament has to be divided. I introduce the knife close to the angle of flexion in the concavity of the contraction and carry it under the skin with the blade flatwise, obliquely upwards and backwards towards the dorsal aspect of the first phalanx, just behind the head of this bone. I then turn the cutting edge of the knife directly towards the bone, and using chiefly the point, cut through the lateral ligament, and by repeated strokes also any fibrous bands connected with the capsular ligament that may be detected. I make sure of dividing everything down to the bone; and then, introducing the knife at a corresponding point on the opposite side, I repeat the same operation.

These two punctures for the division of the lateral ligament on either side of the joint will, I am sure, be sufficient for all ordinary cases; but if, after these divisions, the second phalanx cannot be brought up to a straight line with the first, I would advise the re-introduction of the fascia knife by one of the lateral punctures, and a transverse division of the flexor tendons, by cutting directly towards the joint, not upon the idea that the flexor tendons by their contraction produce the deformity, but with the view of dividing the deeper ligamentous structures, i.e., por-

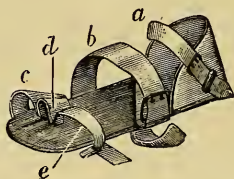
tions of the capsular ligament, and any fibrous structures connected with it. In the displaced position of the articular surfaces there need be no fear of opening the articulation, and if it should be opened by the subcutaneous puncture, there would be no risk of inflammation. Generally I have been in the habit of adopting this plan, but since Mr. Shattock's observations I have limited the operation strictly to division of the lateral ligaments, and the results have been very satisfactory. Some casts of cases successfully treated in this way are now before this Society.

After the operation a compress and plaster should be applied, care being taken to avoid constriction, and the toe bandaged to a metal splint in a slightly flexed position; complete extension is generally too painful. On the third or fourth day the compress and plaster should be removed, and the toe extended completely, if no pain is caused, or as rapidly as it can be borne. A metal sole-plate with divisions for the toes represented in Fig. 26 should then be applied, and worn night and day for three weeks, when a L shaped metal splint represented in Fig. 27, may be used in the day time, as a retentive support, and the patient allowed to walk with an easy boot, but the metal sole plate must be worn at night for several months.

By this method I have succeeded in curing cases which had been previously operated upon without success, by the ordinary method of dividing the flexor tendons. Ten years ago, on the 26th January, 1878, a Lieutenant in the Foot Guards, aged 25, who

suffered from "hammer-toe" in a severe degree, affecting the second toe of the left foot, came under my care. It had been operated upon two or three

FIG. 26.

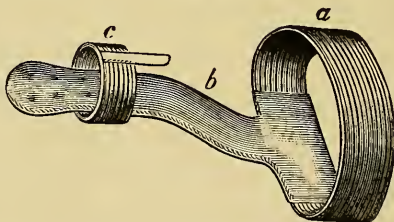


Metal sole plates with slots for the toes, to be applied on the third or fourth day after the operation.

- (a) Ankle strap attached to heel plate.
- (b) Instep strap.
- (c) Separate strap to keep great toe in position.
- (d) Strap passed round the first phalanx of the hammer toe, to make gentle pressure downwards, the extremity of the toe being uplifted by a small pad.
- (e) Strap to maintain the three outer toes in position.

years previously by division of the flexor tendons without any benefit, and now it seriously interfered with his military duties, so that he was quite willing

FIG. 27.



Retentive metal splint, to be used in the daytime at the end of three weeks.

- (a) Strap passing round foot to hold the \perp shaped metal splint in position.
- (b) Digital prolongation, bent to the shape of the foot.
- (c) Strap passed round the first phalanx of the hammer toe, to retain the improved position by gentle pressure.

to submit to amputation. I felt somewhat doubtful as to the result, and he gave me permission to amputate it, if at the time I thought my operation not likely to succeed. I was glad to find, however,

that after dividing the lateral ligaments and some ligamentous fibres in the concavity of the contraction, I was enabled to straighten the toe. The case proceeded very favourably, and at the end of three weeks he was able to resume military duty. I have seen this gentleman frequently since, and am able to say that the toe has remained quite straight, with a fair amount of movement at the joint between the first and second phalanges.

Three of this gentleman's sisters had been under my care for congenital contraction of the fingers, and the right hand of one of them, æt. 17 years, in the third stage of contraction, is represented in the Essay on "Congenital Contraction of the Fingers," Fig. 17, p. 101.

In some cases of greater severity, especially when in adults, or in cases in which the subcutaneous operation has failed, I would recommend the operation suggested by Mr. Wm. Anderson, and which he has successfully performed, of removing the head of the first phalanx, as this would supersede the necessity of amputation, which may now be regarded as an operation of the past.

FIFTH ESSAY.

ON THE OBLITERATION OF DEPRESSED CICATRICES
AFTER GLANDULAR ABSCESSSES, OR EXFOLIATION
OF BONE, BY A SUBCUTANEOUS OPERATION.

FIFTH ESSAY.

ON THE OBLITERATION OF DEPRESSED CICATRICES.*

AMONGST the operations which surgeons are not infrequently called upon to perform, for the purpose of diminishing some of the effects of accident or disease—especially when producing any unsightly appearance—may be mentioned the operations for the removal or obliteration of deeply depressed cicatrices, such as result either from chronic glandular abscesses in the neck, as in *Case 2*, the obliteration of which ten years after the operation is exhibited in Fig. 29; or in this region from abscess depending upon necrosis of bone from the lower jaw, sometimes caused by difficulty in cutting the wisdom teeth, as in *Case 3*, represented in Fig. 30, and its obliteration in Fig. 31.

In the face, deeply depressed cicatrices are sometimes seen as the result of abscess in the antrum

* This operation was first brought before the notice of the Profession in a paper which I read in the Surgical Section at the Annual Meeting of the British Medical Association in Edinburgh, August, 1875, entitled "A New Operation for the Obliteration of Depressed Cicatrices after Glandular Abscesses, or Exfoliation of Bone," and published in *The British Medical Journal*, April 29th, 1876.

connected with decayed teeth, or difficulty in cutting the wisdom teeth in the upper jaw; many examples of this class have fallen under my observation. Also as the result of injury to bone, as in *Case 1*, in which a portion of the malar bone had been carried away by a pistol shot. It was, indeed, this case which, in the year 1864, lead me carefully to study the difficulties to be overcome in obliterating these deep depressions, and to suggest the method of operating which I have now so successfully employed.

Deeply depressed cicatrices are also met with in various parts of the body, as the result either of glandular abscesses, such as occur in the groin, or of abscesses connected with diseased bone as in psoas and lumbar abscesses, which occasionally give rise to very deep depressions, but being removed from sight, rarely call for surgical interference.

If these depressed cicatrices should be produced in childhood they would increase during the period of growth, just as other cicatrices do—a fact which I pointed out, and illustrated by casts and drawings, in a paper published in the “Transactions of the Pathological Society” for the year 1860, Vol. XI. p. 292, and further described in a paper read at the Medical Society of London,* November 17th, 1873.

Deeply depressed cicatrices adherent to the subjacent bone, are frequently seen as the result of abscesses arising from strumous periostitis, with, or without exfoliation of bone, such as occur in the leg, and in the arm, or fore-arm, and sometimes on the

* See “Proceedings of the Medical Society of London,” Vol. I., p 105.

back of the hand after caries of one or more of the metacarpal bones. When occurring in exposed parts of the body, these unsightly depressions may be operated upon and obliterated in the manner I propose; the same may also be said of the depressed cicatrices remaining after gunshot injuries, though when bone has been shot away, as in *Case 1*, it may be possible only to improve the appearance by partial, rather than complete obliteration of the depression.

During my visit to America, in the year 1876, when I attended the International Medical Congress as president of the Medical Society of London, I learnt from the military surgeons at Washington that a large number of these cases of deeply depressed cicatrices existed as the result of injuries received in the late American War, and in the lecture on "Subcutaneous Surgery"* which I delivered at Washington, this operation attracted considerable attention, but to what extent it has been practised by the American surgeons, and with what success, I have not been able to learn.

Various operations have been performed for the purpose of diminishing the unsightly appearance of depressed cicatrices, but the one recommended in the present paper was, so far as I am aware, first suggested and performed by myself in the year 1864.

The operation consists—1st. In subcutaneously

* One of the series known as "The Tonor Lectures," established by Dr. Tonor, of Washington. Lecture VI. on "Subcutaneous Surgery; its principles and recent extension in Practice," delivered in Washington, September 19th, 1876, by William Adams, F.R.C.S., and published by "The Smithsonian Institution," Washington, April, 1877.

dividing all the deep adhesions of the cicatrix by a tenotomy knife, introduced a little beyond the margin of the cicatrix, and carried down to its base, which is sometimes flat and expanded, as in *Case 2*, Miss B., but in other cases the depressed cicatrix is drawn deeply downwards to the surface of the bone, thus ending in a conical point at the apex of the depression, as in *Case 3*.

2nd. In carefully and thoroughly everting the depressed cicatrix—turning it, as it were, inside out, so that the cicatricial tissue remains prominently raised.

3rd. In passing two hare-lip pins—in small cicatrices one pin will be found sufficient—through the base, at right angles to each other, so as to maintain the cicatrix in its everted and raised form for three days, as represented in Fig. 28.

4th. In removing the pins on the third day, and allowing the cicatricial tissue—now somewhat swollen, succulent and infiltrated—gradually to fall down to the proper level of the surrounding skin.

In performing this operation, one puncture with the smallest tenotomy knife, or a still smaller knife, such as Ophthalmic surgeons use, will be found sufficient when the depressed cicatrix is of moderate size, and its adhesions are to fascia rather than bone. In larger cicatrices two punctures, one on each side of the cicatrix, may be necessary; and in some deeply depressed cicatrices adherent to bone, as in *Case 3*, in which the apex of the cicatrix was adherent to the lower jaw, and more than an inch from the external orifice, which was large enough to admit the tip of a

finger, three punctures may be necessary. In this case three punctures were made, one on each side of the cicatrix, and one a little beyond the apex of the depression, the last puncture being made over the margin of the lower jaw, whilst a probe was passed from the neck, down to the apex as a guide to its position. Through these minute punctures the hare-

FIG. 28.

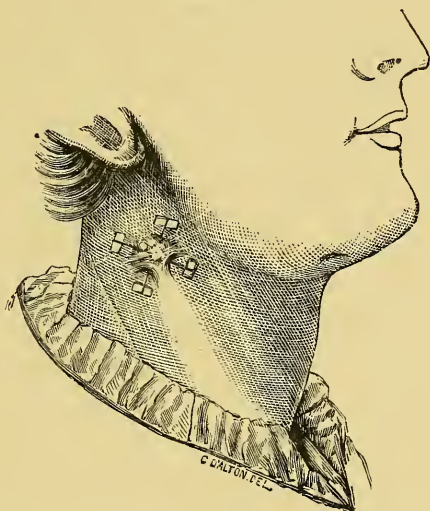


Fig. 28.—Cicatricial Tissue of a Depressed Cicatrix everted after the operation, and retained in this position by two hare-lip pins, the extremities of which are raised and protected by pledgets of lint.

lip pins may be passed, after the cicatrix has been everted, so that even unnecessary needle-scars may be avoided.

The chief difficulty in the operation consists in the careful separation of all the deep adhesions of the cicatrix; taking care to avoid making cutaneous punctures on the one side, and on the other to avoid wounding any venous branches which may be in the

immediate neighbourhood of the cicatrix—a difficulty which had to be carefully guarded against in the case of the young lady described as *Case 2*.

CASE I. *Deeply Depressed Cicatrix on the Cheek after injury to the Malar Bone by a Pistol-shot.*—The first case in which I performed this operation on the 2nd March, 1864, occurred in an officer in the army, Lieutenant B., aged 30, who during the Indian Mutiny, had received a pistol-shot in the cheek. A portion of the lower edge of the malar bone had been carried away by the ball, and a deeply depressed cicatrix remained adherent to the bone. When the muscles of the face were thrown into action, more especially in a smile or laugh, all the features seemed to be drawn towards the depressed cicatrix, which at once became painfully conspicuous.

This gentleman was very anxious to submit to any operation either for the removal of the cicatrix, or calculated to diminish its unsightly appearance; but I was at a loss to know what to suggest. I had on other occasions tried Dieffenbach's plan of subcutaneously dividing the deep adhesions of a cicatrix, and then moving it laterally to a new position, so as to alter its relations, and elongate or destroy its adhesions; but I had not found this plan very successful. I had also dissected out cicatrices and drawn the edges together, after cutting through fat and cellular tissue under the skin, on a plane parallel with its outer surface, so as to evert the edges of the skin; but this operation had failed to remove any deep depression. Many unsightly scars may be re-

moved by this method, leaving only a linear cicatrix scarcely perceptible, but should any deep depression have existed before the operation, it will, to a greater or less extent, gradually return in a few months; the hole does not become filled up, so that this operation did not appear to be applicable to the present case.

Upon reflection, it occurred to me that if, after subcutaneously separating all the deep adhesions of the cicatrix, I could succeed in everting the cicatricial tissue, and retain it in the everted condition for a few days, the depression would become filled up by inflammatory infiltration, and obliterated by adhesions; so that the cicatricial tissue could not again fall down below the level of the surrounding skin. The depression would thus become obliterated, and all the adhesions of the cicatrix to the bone, fascia and muscles, such as produced the conspicuous deformity in this case, would be effectually removed. The only doubt I had in my own mind was, whether in the course of time absorption of the inflammatory lymph would take place, so that the depression would return to a greater or less extent. The case was, however, one of urgency and importance; I, therefore, determined to try the plan of everting the cicatrix, as above described, an operation which I performed for the first time on March 2nd, 1864. As the adhesions to the bone and the adjacent fibrous tissues were close and widespread, their separation was somewhat tedious and difficult; but I succeeded in thoroughly everting all the cicatricial tissue, and passed two hare-lip pins through its base, to retain it in its

everted condition. On the third day I removed the pins, when the cicatricial tissue was in a thickened and succulent condition. It showed no disposition to fall into a depression again, and, indeed, remained somewhat too prominent; but in the course of a few weeks the cicatricial tissue fell to the level of the surrounding skin, and the improvement produced by the operation was extremely satisfactory. A portion of the malar bone having been destroyed, it could not be said that the depression was entirely obliterated, but the deep adhesions of the cicatrix having been thoroughly separated, there was no appearance of a depression towards which the features were drawn when the muscles of the face were thrown into action in talking or smiling. I saw this gentleman at intervals for a long time afterwards, and no disposition to relapse occurred; the improvement was thoroughly maintained, as it has been in all the cases upon which I have since operated.

CASE II. *Deeply Depressed Cicatrix on Right Side of Neck, resulting from Chronic Glandular Abscess.*—The second case which came under my observation was that of a young lady, Miss B. (Fig. 29), who was sent to me by my friend, the late Dr. Sharpe, of Norwood. On the right side of the neck, a little below and behind the angle of the jaw, was a large and deeply depressed cicatrix, which had resulted from chronic glandular abscess. The base of the cicatrix was adherent to the fascia, over the sternomastoid muscle, and its depressed apex dipped down a little in front of the anterior border of this muscle.

At this part a branch of the jugular vein was in close proximity to the cicatrix, which in its size, and general appearance, very much resembled that represented in Fig. 30, but its apex was not so deeply depressed, nor were the adhesions quite so close and wide-spread, differences readily explained by its origin in glandular abscess. This patient was most anxious to submit

FIG. 29.



Fig. 29.—Complete Obliteration of Depressed Cicatrix in Neck, in Case 2, ten years after the operation.

to any operation likely to be successful in the removal of such an unsightly depression, but the late Sir William Fergusson, as well as several other surgeons who had been consulted, advised that no such attempt should be made. I undertook the case, however, in full confidence of success, and the operation was performed on April 27th, 1866, in the same manner as described in the previous case; the only difficulty

arose from the close proximity of the large vein, which was so intimately involved in the adhesions that the greatest care had to be taken to avoid opening it. With such precautions, however, the operation was in every way most satisfactory. The pins were removed on the third day, and the cicatricial tissue remained raised above the level of the surrounding skin for some time. For several months afterwards it remained a little thickened and prominent; absorption, however, gradually proceeded, and the level of the surface was restored, without the least inclination to any depression recurring.

I have frequently seen this young lady since, and up to the present date, now twenty-five years after the operation, not only has the depressed cicatrix been entirely obliterated, so that no inequality of the surface exists, as shown in Fig. 29 (drawn from a photograph taken in the year 1876, ten years after the operation), but from the improvement in the cicatricial tissue, slight traces of it only remain, and require a close inspection to be detected.

CASE III. *Deeply Depressed Cicatrix on Right Side of Neck, consequent upon Abscess with Necrosis of the Lower Jaw.*—H. S., aged 26, was sent to me also by the late Dr. Sharpe of Norwood, in October, 1872. Her general appearance was healthy. On the right side of the neck, a little below and behind the angle of the jaw, was a deeply depressed cicatrix (shown in Fig. 30), large enough at its orifice to admit the end of the little finger, and its apex reaching to the surface of the jaw-bone. The deep surface of the cica-

trix was adherent to the fascia, over the sterno-mastoid muscle, dragging from its anterior border. The free portion of the anterior border was formed by a prominent semilunar fold of the skin, three fourths of an inch in length, and rendered still more prominent in some movements of the head, in consequence of the firm adhesions of the deep surface of the cicatrix. On the opposite side of the neck, a little below and behind

FIG. 30.

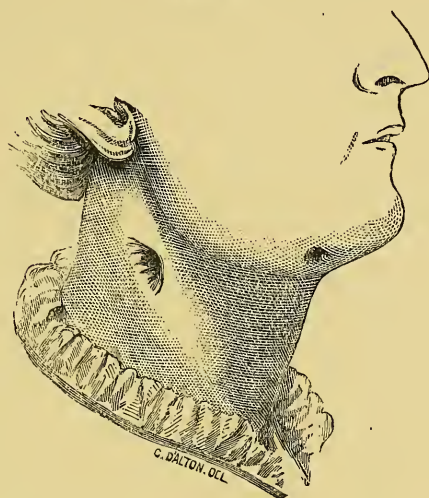


Fig. 30.—Deeply depressed Cicatrix in Neck after Necrosis of lower jaw.

the angle of the jaw, was also a large cicatrix, with its deep surface adherent to the fascia over the sterno-mastoid muscle, and having at its anterior free border a semilunar fold of skin, but without any deep depression. Its general appearance was that of a large, flat, and adherent cicatrix. There were also two small cicatrices, one on each side of the chin, depressed and adherent to the bone.

Of these cicatrices she gave the following history. Six years ago, being then twenty years of age, at the time when the last molar, or wisdom-teeth, were making their appearance, considerable swelling and inflammation occurred about the angle of the jaw, on the left side. The dentist could not force the mouth open, and she was unable to take solid food for a month. At the end of this time, the dentist, with difficulty, extracted the last molar tooth on the left side in the lower jaw; and it is said that some bony enlargement of the fang of the tooth existed. Abscesses about the angle of the jaw and necrosis of the bone followed: several pieces were removed by Dr. Sharpe, and the patient took away small pieces herself. The late Mr. Partridge removed a large piece of bone. A few months later, severe inflammation, with swelling of a similar character, occurred about the angle of the jaw on the right side, and the last molar tooth was extracted with difficulty about six months after the removal of the tooth from the left side. Necrosis of bone also occurred on the right side, and a number of small pieces continued to come away from time to time nearly up to the date of my operation. Altogether less bone, she states, came away from the right side than from the left. Small pieces of bone also came away through two sinuses under the chin, indicated by the small cicatrices alluded to, and shown in the woodcuts. All the molar, and some other teeth on both sides of the lower jaw, had to be removed; and only six of her own teeth now remain in the lower jaw—viz., the four front teeth, and two bicuspidis on the left side.

This patient was most anxious to submit to any operation for the obliteration of the large depressed cicatrix on the right side, which, from its unsightly appearance, and the popular prejudice against a supposed scrofulous constitution, had prevented her from obtaining a situation as lady's-maid. I therefore performed the same operation at the Great Northern Hospital, as that described in the previous cases. It was necessary to take great care to avoid opening one or two large veins leading to the jugular; and the separation of the cicatricial adhesions to the jawbone, and also the adhesions to the fascia over the sternomastoid muscle, was both tedious and difficult; a little venous hæmorrhage occurred. The cicatricial tissue, however, was thoroughly everted, and the hare lip pins introduced, as represented in Fig. 28. These were removed on the third day, when it was evident that a little suppuration had occurred. A poultice was therefore applied for a week, and then wet lint at night, and a piece of soap-plaster during the day. This is the only case in which any suppuration has occurred, and, although it rendered the treatment a little more tedious, it did not in any way mar the ultimate result, which at first I feared it might do. The cicatricial tissue remained in a somewhat infiltrated and thickened condition, above the level of the surrounding skin, for three or four months; but at the end of six months it had fallen to the level of the surrounding skin, and, being of a pale colour, no longer attracted attention. At this time, she obtained a situation as lady's-maid without difficulty. I have frequently seen

this patient since the operation and at the present time, nineteen years since the operation, no trace whatever of the depression remains; the cicatricial tissue alone can be seen; but it is perfectly on a level with the surrounding skin, and has so much improved in texture and appearance, as very closely to resemble it. This is well shown in Fig. 31, from a drawing by Mr. D'Alton.

FIG. 31.

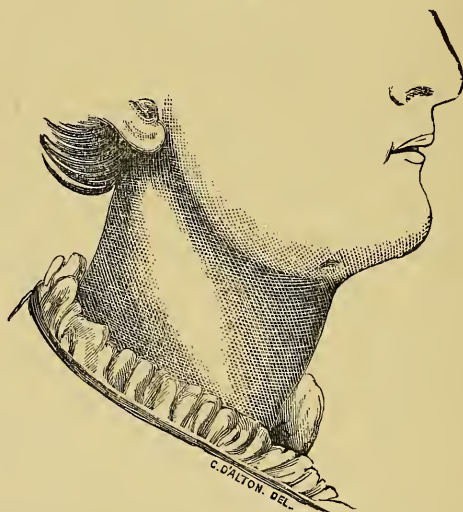


Fig. 31.—Obliteration of Depressed Cicatrix, represented in Fig. 30, from a drawing three years after operation.

After the operation, the cicatricial tissue always loses its shiny, membranous, and vascular character, well exhibited in the cicatrix on the left side of the neck of this patient which has not been operated upon; it becomes thickened, and of an opaque white colour. The cicatrix on the left side of the neck in this patient was flattened and expanded, but not depressed, and therefore hardly necessitating operation, but she

wished me to operate on this cicatrix in order to get rid of its shiny, vascular character, after she had seen this disappear in the cicatrix operated upon on the right side. I told her however that this would gradually disappear in time, and it has done so. The thickening of the cicatricial tissue results from its succulent condition during the three days it remains elevated by the pins, and the inflammatory infiltration at its base.

The permanent result of the operation is placed beyond all doubt by the cases described, and the completeness of the obliteration of the depression and the improvement of the cicatricial tissue has surpassed my most sanguine expectations.

Cases of depressed cicatrices in the neck and face, more especially when occurring in ladies, are those in which the operation I have described may be done with the greatest advantage to the patient, completely removing unsightly scars, often difficult or impossible to conceal.

Although I have repeated this operation for depressed cicatrices in a number of cases since the publication of the first edition, I have in no way altered the details in performing the operation, and the three cases reported are so typical of the different classes into which the cases may be arranged, that it seems unnecessary to report the more recent cases. These, however, have generally been free from the difficulties which occurred in the earlier cases operated upon, in which the operation was more tedious and troublesome than in any others I have since met with.

With regard to the knife used, however, I would observe that instead of the ordinary tenotomy knife, I prefer to use a knife of the same size but with a double cutting edge and central point, so that in separating the depressed base of the cicatrix from any fascial connections, the knife, always being held flat-wise, may be made to cut on both sides, and this I have found materially to facilitate the detachment of adhesions. For the purpose of freeing the apex of a deeply depressed cicatrix from the bone, I still prefer to use a strong backed ordinary tenotomy knife.

If the publication of some of the earlier cases in which I have succeeded in permanently removing unsightly depressed cicatrices in the neck and face, should induce other surgeons to adopt this subcutaneous operation, I feel confident that, with careful attention to all the details described, the success will establish this operation as an ordinary surgical procedure. It is satisfactory to be able to state that I have not seen any disposition to relapse, or any return of the depression.

THE END.

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